Excavating Engineer

Founded 1905

DECEMBER

1956

Earthmoving was begun recently on the first contract section of the 193-mile Illinois turnpike near Rockford by Public Constructors, Inc., Gloucester, N. J. To kick off next year's big highway program, the 1957 Convention and Road Show of the ARBA will be staged in Chicago January 28-February 2. See article on page 22.

"Past performance sold us on a third Bucyrus-Erie"

says Iowa Quarry Operator*

"We bought our third Bucyrus-Erie in December, 1954, on the basis of past performance of our five-year old 22-B," comments this satisfied owner. His three Bucyrus-Erie 22-B shovels are kept busy working 10 scattered limestone pits, all within a 25-mi. radius of Charlotte in Clinton County, Iowa.

To this, the quarry superintendent adds: "Bucyrus-Eries compare favorably with any machines I've been around. That five-year old 22-B has sure moved a lot of stone and has stood up very well. There's not much work to do on them. We've had nothing repaired on the two machines in this pit, except clutch bands and cables. If they don't wear out, you're not doing anything. We've had only one operator on the new 22-B, and he really takes pride in caring for 'his' machine. That, in itself, helps keep maintenance costs low."

And, what about the operators? "In my 35-year experience on several different makes of machines from steam to diesel power," says one of them, "I've found Bucyrus-Eries unexcelled for easy handling, for power when you need it, and for day after day performance with little downtime. I like the simple controls and easy maintenance and lubrication . . . everything's so handy to get at."

You can enjoy the same "personnel" satisfaction in sustained high output and efficient, economical equipment performance. Your nearby Bucyrus-Erie distributor will gladly help you select a size and capacity to fit your needs — from the ⅜-yd. 10-B to the 4-yd. 88-B. See him soon, or write us direct for information.

218E56C

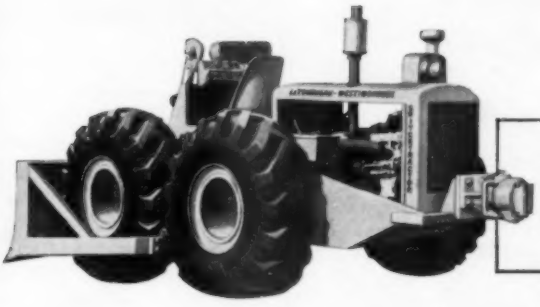
* Name on request

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

NEW
double-duty
SwitchTractor

Famous high-speed work-and-run tractor now available with standard railroad couplers. Railroad drawbar attachment now makes this famous high-speed tractor even more versatile, gives you the plus value of a go-anywhere off-track switcher for car-spotting work.



SwitchTractor

dozes, hauls, switches freight cars

Ten years hard use has improved and perfected the work-and-run Tournatractor. Thousands have proved their value in hauling, dozing, pushing, grading, scarifying, and compacting in practically every country in the world.

Doubles value of Tournatractor

Now — with the new *SwitchTractor* application—this versatile unit gives you added utility. Equipped with standard railway coupler at the rear, SwitchTractor does double-duty, switches freight cars on your siding, in yard or pit. With wide 8'4½" tire gauge, rubber-tired switcher straddles tracks of all gauges.

SwitchTractor often eliminates the need for private switch engines and engineers, saves charges and delays of railroad switch service. Your single SwitchTractor and operator may well handle all your scattered tractor-dozer work — plus whatever freight switching is required.

Off-track travel cuts switching time

Rolling on big, low-pressure rubber tires, 208 hp machine always takes the shortest route to the job. SwitchTractor can either push rail cars (with its dozer or push-plate), or pull with its coupler-equipped drawbar at rear. Tractor can start 18 empty or 5 loaded freight cars, move them up a 1% grade easily.

60% vs 30% coefficient of friction

Rolling on big rubber tires over ballast and ties, not on steel wheels over steel rails, SwitchTractor develops much more coefficient of friction (60% compares to 30%) than track locomotive of *twice* its weight. That means you have plenty of tractive power.

Worthwhile savings with SwitchTractor

If you have to move freight cars in your operations, investigate this versatile new SwitchTractor. Get all the facts on how this coupler-equipped go-anywhere tractor can save money for you in equipment and manpower economies.

SwitchTractor—Trademark, Tournatractor—Trademark Reg. U.S. Pat. Off. ST-1075-M-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

MEET OUR HARD-WORKING AMBASSADOR

HENDRIX *Dragline Buckets*

...in use throughout the world

See you at the ROAD SHOW — CHICAGO
Jan. 28-Feb. 2, 1957

A TYPE FOR EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING COMPANY, Inc.

MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS

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Excavating Engineer

founded 1905

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BPA Member

HARRISON CONSTRUCTION COMPANY turns to M-R-S BIGGER CAPACITY!

One of Harrison's 335 H.P. M-R-S 200 Tractors secures a heaping payload in the matching Woolridge—M-R-S 30 c.y. struck capacity scraper.

UPS PRODUCTION ON MULTI-MILLION YARD TEXAS PLANT SITE WITH 30 C.Y. M-R-S HAULING UNITS!

MILLIONS of yards of tough rubbery coastal gumbo to be moved! Exceedingly long hauls ranging up to 5200 feet one way! Shallow cuts and fills extending over a wide area! Close production schedules! Harrison Construction Company, internationally known earthmoving firm, faced these problems on their big Point Comfort, Texas plant site job . . . and is **beating these problems with M-R-S Tractors!**

WITH five M-R-S 200 tractors and matching 30 c.y. Wooldridge—M-R-S scrapers, Harrison Construction is meeting their close production schedules and setting new standards for earthmoving production.

USING **M-R-S Weight Transfer** for maximum traction to assist the push tractor, Harrison's M-R-S 200's secured heaping payloads in minimum time and distance . . . even working with the tough coastal gumbo. Hauling full loads at faster speeds, using the M-R-S power and positive roll-out ejection for faster dumping, and dead heading back at faster speeds, Harrison gains valuable yards each cycle that add up to bigger production.

HARRISON Construction Company, like many progressive earthmoving firms all over the country, is setting new production standards with M-R-S earthmoving equipment. Regardless of the size of **your** jobs . . . regardless of **your** present operation, **it will pay you to investigate the many profit advantages you can gain with M-R-S equipment.**

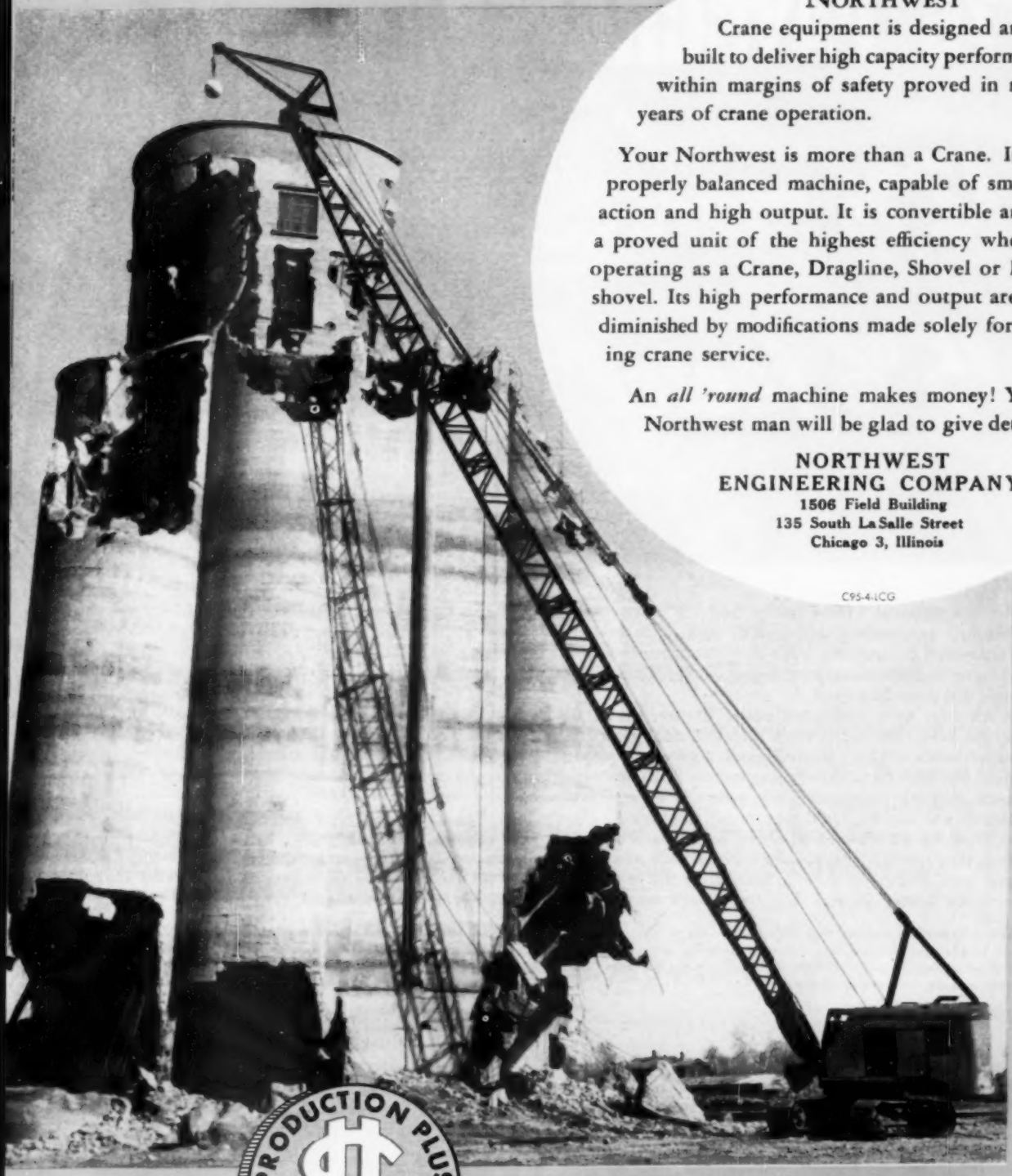
SEE M-R-S bigger capacity earthmoving equipment on display . . . get the complete M-R-S BIG PROFIT story at the A.R.B.A. ROAD SHOW, Chicago, January 28-February 2, 1957.

Investigate before you invest!

THE EMBLEM OF DEPENDABILITY M-R-S MANUFACTURING COMPANY

FLORA, MISSISSIPPI, U.S.A.

IT TAKES MORE THAN COUNTERWEIGHT TO MAKE A CRANE!



NORTHWEST

Crane equipment is designed and built to deliver high capacity performance within margins of safety proved in many years of crane operation.

Your Northwest is more than a Crane. It is a properly balanced machine, capable of smooth action and high output. It is convertible and is a proved unit of the highest efficiency whether operating as a Crane, Dragline, Shovel or Pull-shovel. Its high performance and output are not diminished by modifications made solely for lifting crane service.

An *all 'round* machine makes money! Your Northwest man will be glad to give details.

NORTHWEST
ENGINEERING COMPANY
1506 Field Building
135 South LaSalle Street
Chicago 3, Illinois

C95-4-ICG

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

· PRODUCTION PLUS · $ · MEANS MONEY ·

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

TURNPIKE TESTS PROVE:

"75" PAYSCRAPER®

CARRIES

12% more...

DELIVERS IT

15% faster

. . . . .

TD-24 push

An International TD-24 tractor and "75" Payscraper recently out-pushed, out-loaded, and out-sped all equal-sized competitive units in accurate on-the-turnpike tests. This data was obtained on the Illinois toll road job near Rockford.

All tests were conducted under similar conditions on the same cut, in the same material, and under the supervision of the contractor's grade foreman. Loading time was limited to exactly one minute. Scraper loads were weighed on special new accurate scales. Haul length was held to 2,000 feet for all scrapers.

Final figures amazed all observers! Results showed first, that *the "75" Payscraper carried 12% more dirt per load...delivered it 15% faster than the other two scrapers tested;* second, that *the TD-24 torque converter pusher heaped an average of 1.2 cu yd extra into all scrapers tested.* (See charts, at right.) A competing manufacturer substantiated these same figures!

Here's conclusive proof that no matter what scraper the TD-24 pushes, you load more in any given time... and that the "75" Payscraper carries more, no matter what pushes it! And that the TD-24 and "75" Payscraper, teamed together, out-produce other equipment combinations with faster loading, bigger loads, and all-around faster cycles.

Prove the stand-out pushing, loading, and cycle-speeding performance of the International TD-24 tractor and "75" Payscraper on your own jobs. Ask your International Construction Equipment Distributor for a demonstration!

Load-Speeding Action. High horsepower-to-weight ratio and speeds up to 24 mph—plus operating ease of air-assisted clutch; big, safe, 4-wheel air brakes; exclusive Hydro-Steer—all help the Payscraper gain time, increase earth-moving capacity!

Clipboard in Hand, equipment engineer signals "75" to begin controlled one-minute push-loading from TD-24 torque converter tractor. Although TD-24 push-packed an average 1.2 cu yd more in all scrapers, it loaded 2.1 cu yd more in "75" Payscraper, than competing pusher!

loads 1.2 extra yds. into all scrapers!

PAYLOAD TESTS (average)

Pusher	International "75" Payscraper	Scraper "A"	Scraper "B"
International TD-24 Torque Converter tractor	20.6 cu. yd.	18.2 cu. yd. "75" bonus 2.4 cu. yd.	17.5 cu. yd. "75" bonus 3.1 cu. yd.
Pusher "A"	18.5 cu. yd.	17.0 cu. yd. "75" bonus 1.5 cu. yd.	17.1 cu. yd. "75" bonus 1.4 cu. yd.

CYCLE TIME TESTS (average)

International "75" Payscraper	4.8 min.
Scraper "A"	5.7 min.
Scraper "B"	5.6 min.

"75" Payscraper Proves 15% faster ... delivers up to 19 extra loads per 10-hour day

See you at the ROAD SHOW—CHICAGO Jan. 28-Feb. 2, 1957

INTERNATIONAL HARVESTER

INTERNATIONAL® Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

on the roof of Europe
Amid the peaks of the French Alps, work on the Serre Poncon earth dam project continues apace. This first step towards the harnessing of the Durance river for power generation, is in the capable hands of Compagnie Industrielle de Travaux. Prominent in their earth-moving equipment is a fleet of Aveling-Barford SL Dumpers. Capable of carrying 22,400 lb. payloads at speeds up to 22 m.p.h. these rugged haul units provide the answer to economical earth-moving on all big jobs.
Folder Number 1724/10 giving particulars freely available on request.
AVELING-BARFORD SL DUMPERS
AVELING-BARFORD LIMITED GRANTHAM ENGLAND

SPEED TRENCHING

with Bucyrus-Erie Hydrohoe and 6 Interchangeable Tools

The all-hydraulic Bucyrus-Erie Hydrohoe combines the speed and maneuverability of a conventional truck, the precise control resulting from all-hydraulic operation and the added versatility of six special tools to give you *the machine* best suited to a wide variety of trenching jobs. Contact your nearby Bucyrus-Erie distributor now. He will be glad to demonstrate. 128H56C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

WRIST-ACTION DIPPERS are quickly interchangeable. Standard 18-in., shown above, narrow 12-in., or wide 24-in. cut the size trench you need . . . save time and expense by reducing amount of backfilling needed. Side cutters are available for these dippers for cutting trenches of additional width.

SPECIAL UTILITIES DIPPER (right) is 20 inches wide . . . has increased wrist action for short, deep pits. Rotating 95 degrees at the handle, this dipper permits undercutting, squaring corners . . . reduces hand labor on manhole, catch basin, valve or repair excavations . . . reduces amount of backfill required and amount of concrete or black top resurfacing.

THE HYDROSHOVEL (right) consists of H-3 Hydrohoe provided with double acting digging ram and 60-in. wide dipper. With it, you clean drainage ditches quickly with normal hoe action. In reversed position, with loader action, you dump on opposite bank away from road and shoulder.

COMBINED POWER UNIT AND AIR COMPRESSOR (right) mounted on the Hydrohoe gives you plenty of power for a variety of air tools without the usual transporting problems. This optional combined unit delivers 120 cfm at 100 psi.

WHAT

JAN. 28 FEB. 2nd 1957

YOU'LL HEAR THERE

THE ARBA CONVENTION

will open Monday morning, January 28, 1957, with suitable ceremonies. For five days you will have the opportunity of attending the greatest seminar on roads and road construction ever gathered together. Every effort has been made to secure people of importance and authority to talk to you on the critical subjects of the industry.

You will hear:

- Senator Albert Gore of Tennessee
  Chairman of the Senate Sub-Committee on Roads
- Senator Dennis Chavez of New Mexico
  Chairman of the Senate Committee on Public Works
- Rep. George H. Fallon of Maryland
  Author of the Highway Bill and
  Chairman of the House Sub-Committee on Roads
- Senator Francis Case of South Dakota
  Ranking minority member of the
  Senate Sub-Committee on Roads
- Rep. Charles Buckley of New York
  Chairman of the House Sub-Committee on Public Works
- Rep. J. Harry McGregor of Ohio
  Ranking minority member of the
  House Sub-Committeee on Roads

—and many other well-known authorities on the Road situation. These men have played a great part in the formation of the coming road program. No group knows the subject better.

Technical Sessions will begin Monday at 1:30 P.M. and *You will hear:*

- W. A. Warrick, Consulting Engineer of the John Clarkson Co. of Albany, N. Y.; and K. B. Woods, Head of the School of Civil Engineering, Purdue University. They are outstanding authorities on "The Design of Rigid Type Pavements."
- Fred F. Florence, President of the American Bankers Association (Republic National Bank of Dallas, Texas) will speak on "The Bankers' Part in the Accelerated Federal Aid Road Program."
- A. E. Johnson, Executive Secretary, American Assn. of State Highway Officials, Washington, D.C., talking on "State Financing of the Road Program."
- A. C. Clark, Deputy Commissioner, Engineering Div., U. S. Bureau of Public Roads. His address will be, "Engineering the Accelerated Road Program."
- George M. Foster, Chief Deputy Commissioner, Michigan State Highway Department, East Lansing, Michigan, will talk on "Building Roads with Modern Engineering Methods."

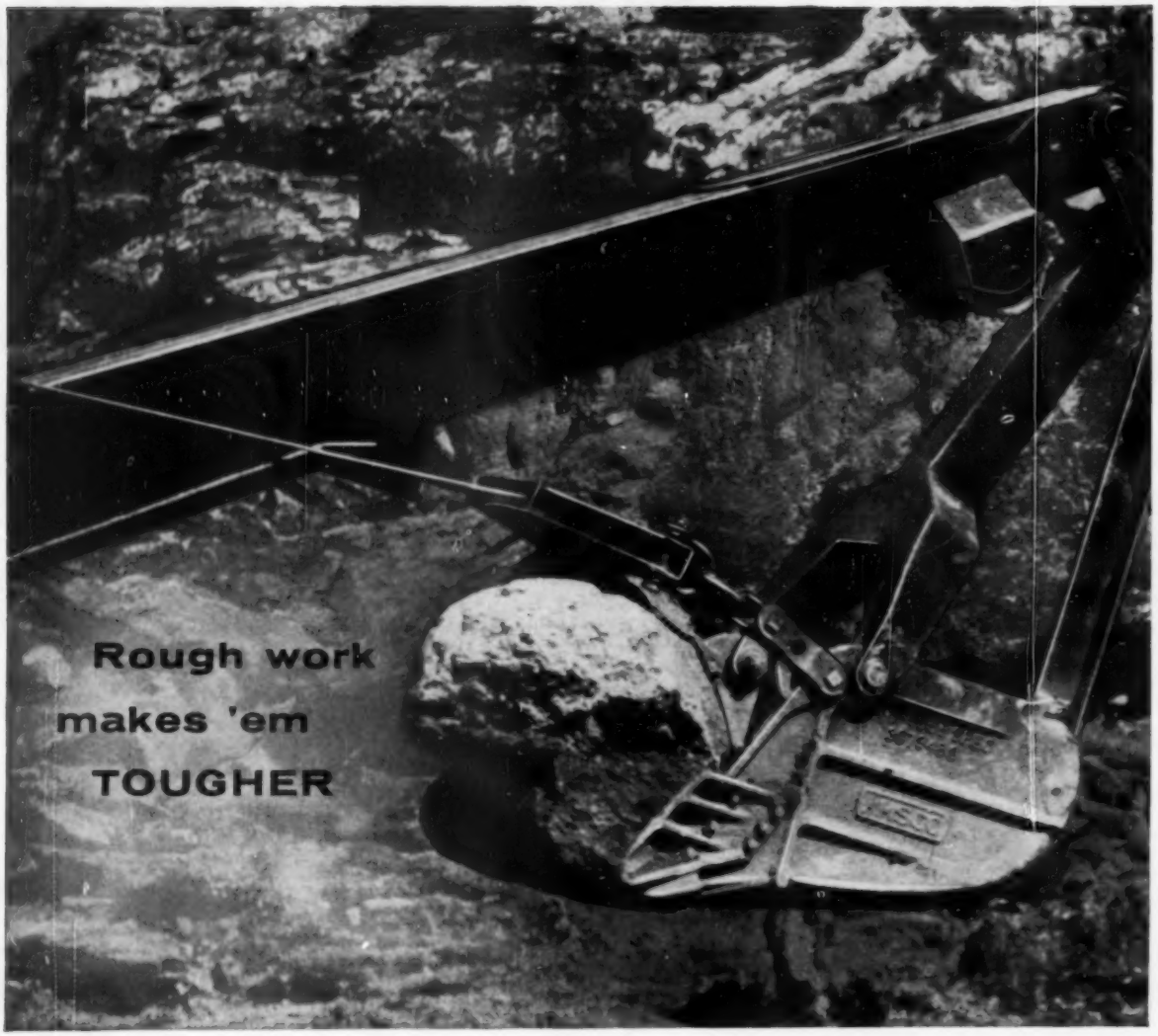
Other important subjects will be discussed by Nationally Known Experts.

- James W. Spencer, Highway Research and Extension Engineer, Department of Agricultural Engineering, Cornell University. President, Educational Div. of ARBA. He will discuss, "Keeping Highway Engineering Education Abreast of Modern Techniques."
- Fred Burggraf, Director, Highway Research Board, Washington, D. C., will give a report on "AASHO Illinois Test Road."
- J. E. Buchanan, President, The Asphalt Institute, University of Maryland, will give an address—"Bituminous Materials for Pavement Construction."
- C. Homer Cash, Road Engineer, Michigan State Highway Department, Lansing, Michigan, will talk about "Reinforcing Concrete Design Practice in Michigan."

There will be panel discussions on the many problems of the engineer and contractor. Photogrametry, electric computors, traffic problems, maintenance, bituminous pavement construction, stabilization, financing, illumination and related subjects will all be treated in detail.

This is just a small part of the total program. MAKE YOUR PLANS TO ALLOW SUITABLE TIME TO ATTEND THESE IMPORTANT SESSIONS.

INTERNATIONAL AMPHITHEATRE
CHICAGO



Amsco Backhoe Buckets **WORK-HARDEN IN SERVICE**

One-piece castings of extra-tough manganese steel give maximum impact and abrasion resistance

Impact work-hardens manganese steel to as high as 550 BHN. Further abrasion only polishes this tough steel. That's why Amsco® manganese steel outlasts other steels by as much as ten to one, under heavy impact and abrasion.

An Amsco Backhoe Bucket is a tough, *one-piece* manganese steel casting. This one-piece body eliminates the danger which fabricated-bucket users face of the hoe bucket breaking up when digging in rock or rough operations. The teeth on Amsco hoe buckets are reversible and renewable, and side cutters can be bolted on to order.

On scores of tough digging jobs, you'll find these Amsco buckets cutting a full swath, unloading cleanly and providing maximum digging efficiency.

Available in both standard and special styles, in all regular sizes from ¾-yard to 1½-yard capacity. For full information, call your nearby Amsco representative or your shovel manufacturer's dealer.

AMERICAN Brake Shoe COMPANY

AMSCO

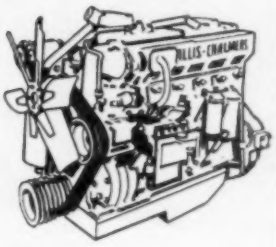
American Manganese Steel Division · Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

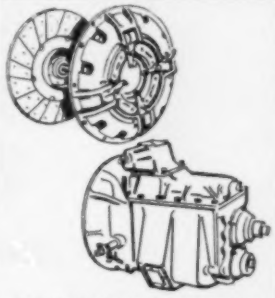
Look at the EXTRA WORK OUTPUT

the Allis-Chalmers TS-360 Motor Scraper gives you

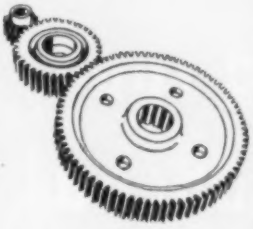
Here are some of the design features that put the TS-360 way out in front in steady performance, dependability and length of service life.



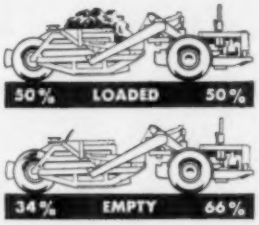
MORE USABLE HORSEPOWER. Allis-Chalmers diesel engine delivers 280 hp — 18.66 hp for each struck yard. This power gets the TS-360 away from the pusher fast . . . gives you speedier cycles, more trips per hour. In this engine, follow-through combustion holds effective working pressures to take advantage of better crankshaft leverage.



BIG-CAPACITY CLUTCH AND TRANSMISSION give fast, smooth operation under all job conditions. Clutch has air-actuated booster to reduce clutching effort and increase shifting efficiency. The heavy-duty transmission gives unmatched torque output in each gear range.

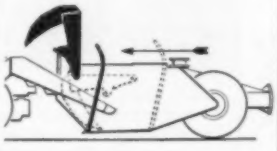


EXTRA-HEAVY FINAL DRIVES feature rugged differential assembly, carrier-housed drive shafts, final drive gears supported by large roller bearings and heat-treated drive axles. This long-life power train transmits maximum engine output for extra work volume, extra profit.

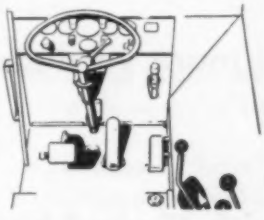


EXTRA TRACTION. The TS-360 motor scraper provides greater tractive effort, loading or traveling. Two-thirds of the empty weight is carried on drive wheels. Loaded weight is distributed equally between tractor and scraper wheels for better balance, increased flotation, safer hauling.

EASY-LOADING BOWL. Wide, low bowl design with curved bottom and offset cutting edge assures full capacity loads in less time. Curved bowl bottom "boils" dirt in, filling corners, heaping load with less spillage.



CONTROLLED DUMPING ACTION. Forward movement of ejector forces out load. High apron lift prevents material from jamming. This combination provides a continuous flow of material for a smooth, even spread.



POSITIVE STEERING. Two-stage selective power steering makes the operator's job easy . . . provides safe, feather-touch response and full maneuverability whether traveling at high speeds or in cut or fill

OPERATOR CONVENIENCES add to production, too. Easy-to-reach controls, full visibility, four-wheel air brakes, roomy platform, comfortable air-foam seat are some of the features that help operator get maximum output from the TS-360

More and more TS-360's are coming into your area every day. Ask your Allis-Chalmers construction machinery dealer where you can see them in action. Remember, too — your Allis-Chalmers dealer stocks True Original Parts and offers factory-approved service methods and factory-trained servicemen for your convenience.

ALLIS-CHALMERS CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Euclid

'TWINS'

will move the CHEAPEST DIRT on the big road program ahead!

- Twin-Power "Eucs" out-perform all other equipment by a wide margin — the *profit* margin
- "Twins" move more yardage . . . wet or dry . . . hard clay or loose sand
- Contractors with "Twins" have a bidding advantage
- "Twins" can set new production records at lower cost on *your* jobs

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

To move dirt at the lowest cost set your sights on Euclid "TWINS"

Because it self-loads in any scraper material, the Twin-Power Scraper works independent of other equipment. It is revolutionizing road building methods on jobs where concentration of equipment in any single cut is not practical.

Unequalled power, speed and maneuverability make the TC-12 a top performer. It has all the features you've wanted in a big crawler.

Ask your dealer for proof that Euclid "Twins" are your best investment

- **Check actual production figures from a wide range of jobs**
- **Compare "Twin" performance with that of your present equipment**
- **See movies of "Twins" at work on jobs like yours**
- **Check the list of owners who are using "Twins" to cut their earthmoving costs**

Get in touch with your Euclid Dealer today!

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

S & M Construction Company, Providence, R. I., uses 12 of these Mack LJSWX diesel dumpers under 2-yard Lorain shovel in excavating peat bog near Atholl, Mass., on a by-pass for U. S. Route 20.

ONLY A SPECIALIST NEED APPLY...

. . . For only Macks can get in and out of mud like this under their own power!

Axle deep in soft, soupy mire and hauling a full load of heavy peat bog, 80% water, this Mack dumper will pull out of the muck and be on its way . . . and back again on schedule.

It's Mack's famous Balanced Bogie, along with Mack's exclusive Power Divider, that makes seemingly impossible tasks like this everyday assignments for Macks. This wonder-working team delivers torque to each wheel in proportion to its traction. In addition, it assures uniform tire loading and braking on all four rear wheels, and maximum stability under any terrain or road conditions.

When you add the Balanced Bogie and Power Divider to Mack's rugged construction, ease of maintenance, and economy of operation, you'll see why Macks are the most versatile trucks, the biggest money makers in the construction industries today. See your Mack Branch or Distributor for complete details. Mack Trucks, Inc., Plainfield, New Jersey.

MACK . . . *first name for trucks*

3569

Here's Why a NEW BUCYRUS-ERIE BUCKET Belongs on the Business End of YOUR Dragline

HERE are some of the reasons why a Bucyrus-Erie bucket will improve the over-all performance of your dragline.

FAST DIGGING, FULL LOADING: "Slicing-action" lip penetrates material quickly and easily. Tapered basket is scientifically shaped to load full and fast. Strong BECOLOY tooth bases hold teeth at proper angle for best digging and to provide full clearance for the bucket.

SMOOTH CARRYING: Proper flaring and balance minimizes bobbing and spilling. Strong, lightweight chains offer maximum strength and safety.

RAPID, CLEAN DUMPING: Smooth inside design and high arch contribute to fast, clean dumping. Free-rolling dump block with sealed tapered roller bearing assures smooth performance and long rope life.

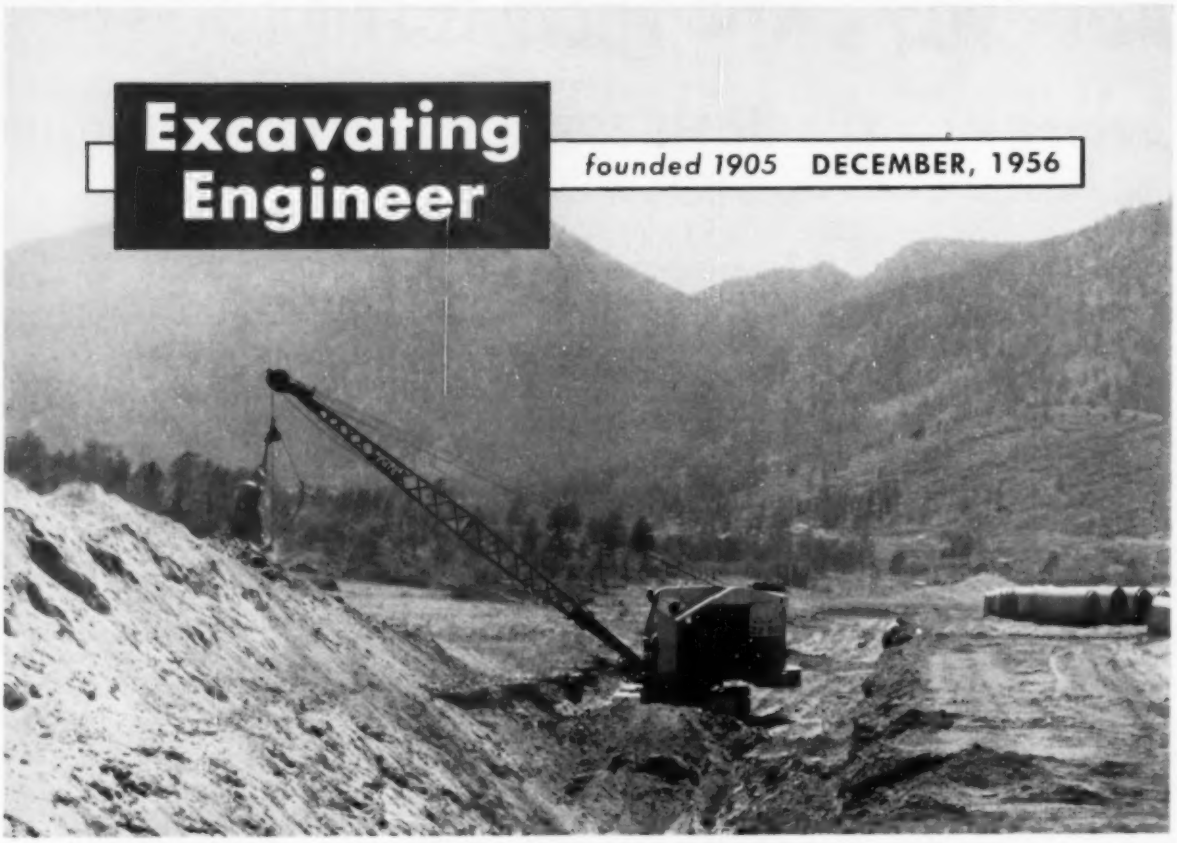
LONG WEARING: Hardened BECOLOY teeth are easily replaced. Long clevis plates provide strong side-plate support. True circle rope sockets grip full spiral of six strands to save cable.

15R56C

The return on your entire investment in a dragline depends to a great extent on the efficiency of the bucket it swings. Get the most out of your dragline — equip it with a new, lightweight, high-output Bucyrus-Erie bucket. Your distributor will supply full information on these outstanding performers — available in light-, medium- and heavy-duty types, solid or perforated.

South Milwaukee BUCYRUS ERIE Wisconsin

Excavating Engineer
founded 1905 DECEMBER, 1956



A ¾-yd. dragline digs trench for a 60-in. storm sewer line on site of the Air Force Academy near Colorado Springs, Colo.

Contractors Begin 'Operation Falcon'

Preliminary work begins at site of $126 million U. S. Air Force Academy, Colorado Springs, Colo. Storm drain subcontract moves fast, exemplifying hurry-up pace of 1956 season.

by Ray Day

SUMMER, 1956. Purple shadows of the Rampart Range of the Colorado Rockies; dragline bucket teeth biting deep into red ground as a bucket fills to overflowing. A hoist line snaps taut. A boom swings over a spoil pile. Dirt moving is under way for "Operation Falcon."

Not far from the Colorado Springs site of the new United States Air Force Academy, Capt. H. H. D. Heiberg, Jr., has custody over the newest mascot of the armed forces of the United States. On Capt. Heiberg's left hand, perched on a gauntlet, is a peregrine falcon, probably the most ferocious bird of prey known.

The falcon has been selected by the first class of cadets at the Air Force Academy, now in training at Lowry Air Force Base near Denver, to be their official mascot. This falcon, unlike the Army mule or the Navy goat, gives the impression, like the Air Force, of deadly serious business. The falcon and the dragline bucket are symbols of forces working together in a common cause—the creation of an even stronger Air Force.

The dragline bucket belongs to a ¾-yd. excavator, which is being worked by Hardeman Construction Co. of Denver on a $225,000 subcontract for construction of the storm drainage system at the new Academy. Although this subcontract with prime contractor T. F. Scholes, Inc. of Reading, Pa., is small in relation to the $126 million cost of the new institution, it exemplifies the head start which construction men have made in 1956 on the new air center. In slightly more than six weeks time, Hardeman's subcontract advanced 24% ahead of its projected schedule. That feature alone makes it one of the better examples of construction work let at the Academy to date.

Credit for the hurry-up performance goes to Sidney Hardeman, president of this small construction company. Under Hardeman's personal supervision, assisted by a crew of only eight other employees, a major storm sewer system involving 15,000 feet of pipe, from 4 to 60 inches in diameter, is rapidly taking shape. And this is being done in the face of tight specifications which require curved finegrade for the pipe-

lines, 95% density backfilling to the spring lines, and high quality backfilling to the point where the pipe is covered. Even the biggest diameter storm sewer lines—60-in. diameter double-strength reinforced concrete pipe joints which weigh over seven tons per 8-ft. section—are going in rapidly. Hardeman placed 570 feet of this big pipe in only six days, excavating material ranging from gravel to fairly hard sandstone, with trench cuts 22 feet deep.

A Cat D2 dozer works in bottom of the trench shoving material within reach of the dragline bucket. Practically all fine-grading was done by this small machine.

Emphasize Mechanization

To push the storm drain installation job as rapidly as possible, Hardeman emphasized mechanization and excluded manpower as much as possible. His crew consists of a field foreman, dragline and tractor operators, and a small pipeline crew which will be reduced even further after the large-diameter, heavy pipe is finished.

In setting up the organization, Hardeman was governed by several factors over which he had little or no control. For example, the daily capacity of the Denver plant of Lock Joint Pipe Co. consisted of 80 feet of 60-in. diameter pipe and 80 feet of 54-in. diameter. Hardeman soon found that his crew could lay that amount in half a shift. Obviously, the wise move was to build an all-purpose crew: the dragline digging the trench and laying pipe, the crew installing pipe sections and then moving back to install compacted backfill during the time they waited for pipe shipments to build up. That way everybody stayed on the payroll, and everybody worked to good purpose.

Later on, when smaller diameter pipe is laid, the excavating dragline will be equipped with a dragshovel boom and dipper for more rapid digging in shallower trenches. The pipe sections can be laid by the dragshovel as it moves along, since the sections will be much lighter. Most of the pipe is concrete, although

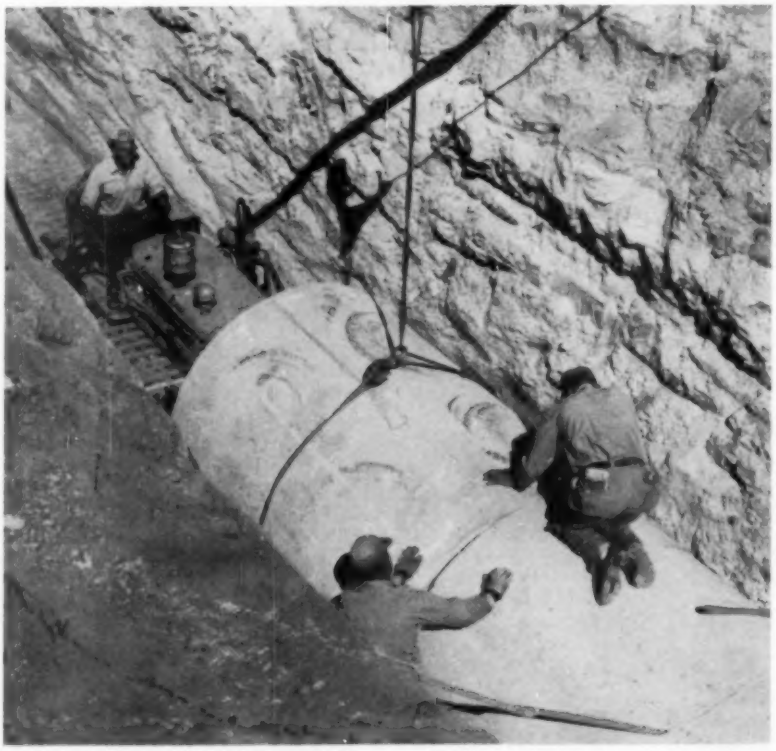
Here's how the excavation looked to men working inside the concrete pipe mortaring joints. Trenches were up to 24 feet deep.

Following completion of the trench, the machine picks up each 7-ton pipe section with a cable sling and swings it in place.

some perforated clay pipe in 4 and 8-in. sizes is specified. There is also some cast iron and some corrugated metal pipe.

Toughest work on the storm sewer installation consisted of cuts up to 24 feet deep through sand, gravel and hard clay. In equipping for this job, Hardeman realized the machine he selected should be able to dig tough materials, preferably without drilling and shooting, and at the same time should have sufficient lifting capacity as a crane to handle the 7-ton plus pipe joints. For that reason, he arranged to use a Bucyrus-Erie 22-B dragline, owned by Stitt & Herrick Construction Co., Denver, for the life of the job on a rental basis. Stitt & Herrick furnished the machine complete with a 50-ft. dragline boom and Bucyrus-Erie ¾-yd. bucket, and a dragshovel boom and ¾-yd. dipper.

Hardeman then tried another innovation designed to help the dragline and speed fine grading simultaneously. In the bottom of the trench, he placed a small Caterpillar D2 tractor with a dozer blade, which worked toward the dragline, shoving up the last few inches of material to give the dragline a chance to work at full capacity at each pass. The idea worked nicely; in fact, it was



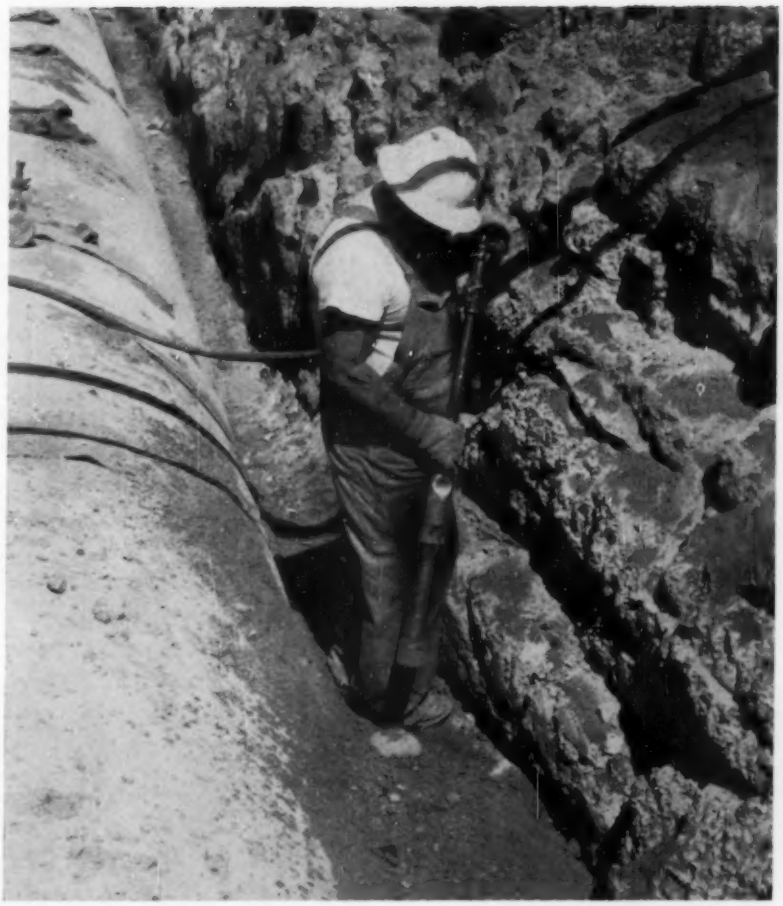
With a timber lashed to its dozer blade as a cushion, the Cat D2 pushes a section of pipe home against its slip-on type joint. Double-strength pipe is being used.

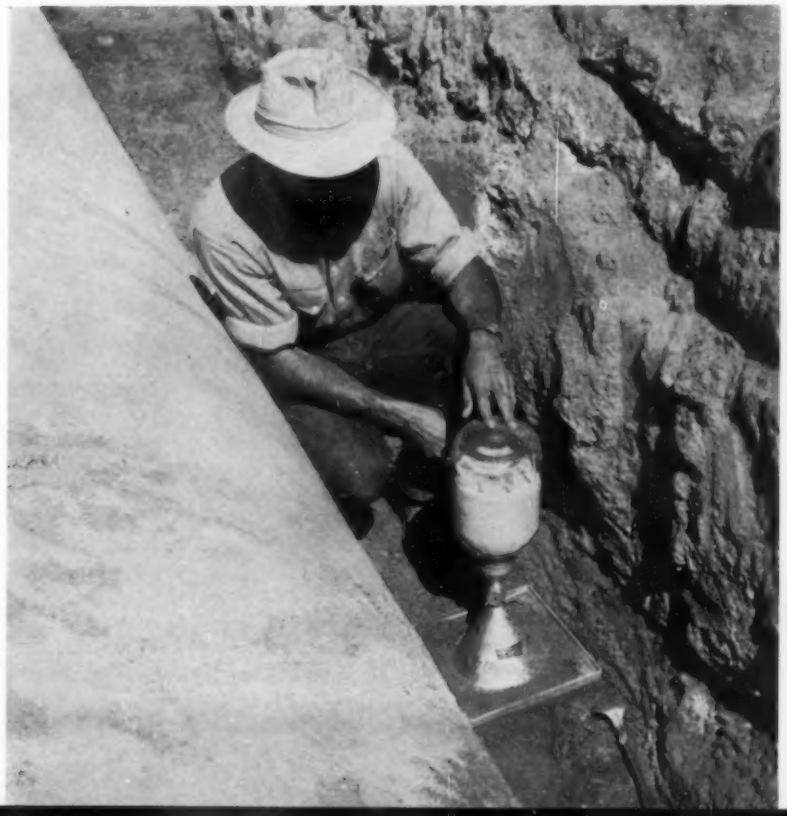
improved upon by turning the tractor around at pipe setting time and using this machine instead of the usual chain hoist to push the pipe sections to locking position against their rubber gaskets. A heavy timber softener was chained to the dozer blade to push against each pipe section as it was laid.

Dragline Works Full Shift

Usual practice on the big-diameter storm sewer line is to use the 22-B on trench excavation for perhaps a full eight-hour day, allowing two days' supply of pipe sections to build up. During this time the D2 dozer works in the bottom of the trench, followed by limited hand excavation which is necessary to establish a full contour bearing for the first 1-ft. chord on the pipe. Some of this fine graded material, thrown out by hand labor, is used for the first portion of the compacted fill under the spring line. According to Hardeman, it may be necessary to work the 22-B a six-day week, ten-hour day, if future capacity of the pipe manufacturing plant increases.

Driven by a Caterpillar engine, the 22-B has had no trouble in excavating the hardest material without the use of explosives. Some of the muck is so hard that tooth marks appear all along the sides of the trench. The little D2 dozer also uses scarifier teeth under its dozer blade to assist in ripping the last few inches.





(Above) Backfill is tamped down with a Thor air gun powered by a Jaeger 75-cfm compressor. (Below) A soils technician takes a sample of the compacted material.

Following completion of the trench excavation, the machine then moves back, picks up each pipe section with a cable sling and places the seven-ton weight at the bottom of the trench. Final finegrading is done at this time. As the slip-on type joints begin to connect, the D2 dozer pushes the joints to final position against their rubber gaskets. After a string of pipe is laid in this manner, the crew moves in to mortar the joints while the 22-B moves back on the ditch line to resume excavation. It is a well-organized, tight-knit operation, closed up safely in short distance to the point where Hardeman or Foreman Earl Melton can watch the entire operation at any one time.

Later on, the same crew moves down the line with three Thor air tampers powered by a Jaeger 75-cfm compressor (one of the tampers is used as a standby) to compact the backfill above the pipeline. A tank truck hauls water to this operation, so that the dirt can be

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Here's a sample of the variety of construction equipment that will be displayed at the 1957 Road Show. Scene is at 1948 show.

Roadbuilding's Greatest Show

AFTER a lapse of nine years, the American Road Builders' Association's Road Show will take place again early next year. The big event is scheduled to run January 28—February 2 in the largest exhibit hall in the United States—Chicago's huge International Amphitheater.

Labeled the "World's Fair of the Construction Industry," the Road Show is being staged for the benefit of thousands of contractors, highway engineers, and public officials who will be in Chicago that week for ARBA's 1957 annual convention.

Purpose of the show is to assemble as many different kinds of machinery in one place as possible for the inspection of equipment users. Nearly 250 members of the Construction Industry Manufacturers' Assn. will cram their latest models into 300,000 square feet of display space in the halls of the Amphitheater.

Largest industrial show ever assembled under one roof will be staged in Chicago's International Amphitheater January 28-February 2, in conjuction with annual ARBA convention.

Compact Show

The Road Show will be the biggest industrial exposition ever assembled under one roof. It will occupy less space than the 1948 Road Show which was held outdoors on Chicago's lakefront, but exhibits will be more compact and attractive to the thousands of viewers taking advantage of construction's off-season.

"Since the 1948 Road Show, there has been a virtual revolution in equipment —what it can do and how it does it," pointed out Road Show Chairman Julien Steelman, president of the Koehring Co., Milwaukee. "Horsepower in some production units has doubled; new materials have made possible some important design features, and entirely new devices are on the market.

"Contractors who want to compete successfully know they have to keep abreast of such developments. The contractor who is alert will pick up information at the Road Show that will put him way out ahead of the competition in his community. It may be a new machine that can handle his peculiar job faster, or a new technique that will enable him to squeeze more out of his present fleet. Whatever it is, it will more than pay for the trip and his time."

Invite Foreign Guests

Foreign visitors from at least 50 different countries are expected to attend. Show managers are going to great lengths to make inspection trips pleasant for visitors. Comfortable reception lounges, refreshment facilities, and a complete telephone center will be built in the Amphitheater. More than $100,000 will be spent on lavish decorations. The job will require 1,000 carpenters, electricians and other stage men.

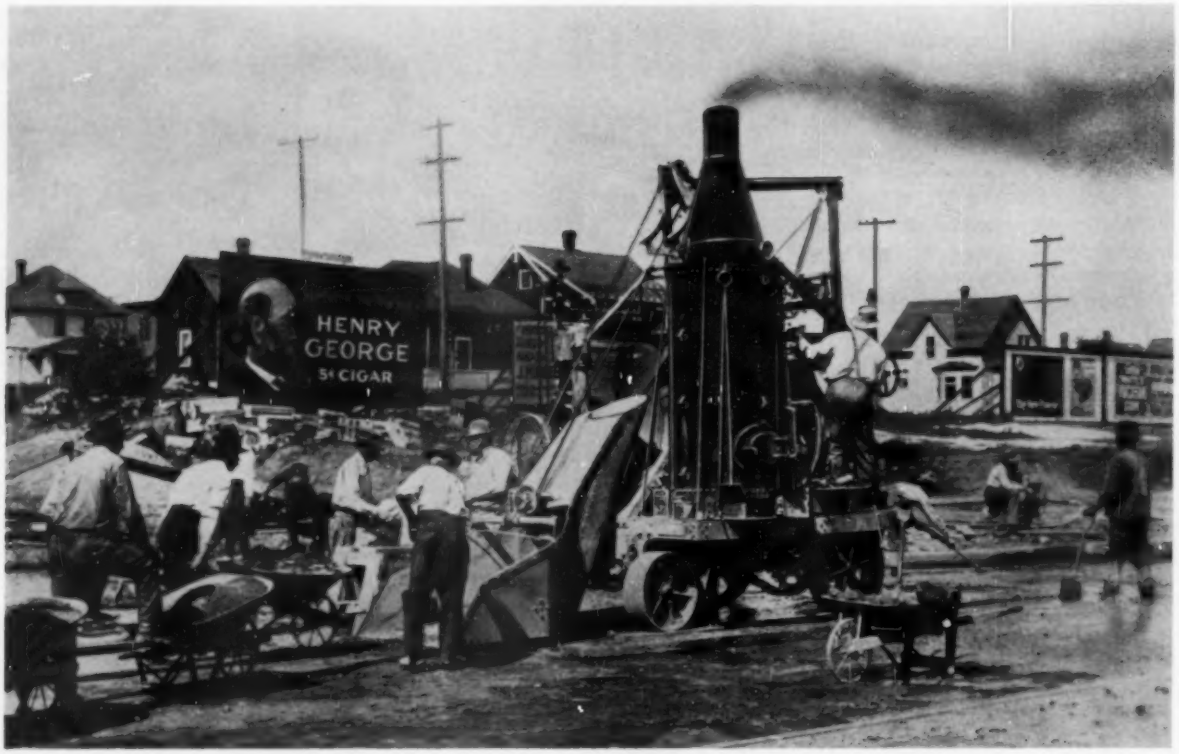
Between 1,500 and 1,700 manufacturer representatives will be on hand to demonstrate or explain their company's products. Thirty-five special buses will shuttle visitors on a continuous schedule between convention hotels in downtown Chicago and the Amphitheater.

The ARBA convention itself will feature national leaders as speakers, and numerous technical sessions for highway engineers.

"We are going to make January 28—

Latest developments in earthmoving equipment will be seen at Road Show. Scrapers are gouging out a huge 8½ million yard cut on a California bridge project.

At the time of the first Road Show in 1909, this puffing, clanging steam shovel kept long trains of teams and dump wagons busy.



Here's an early steam concrete mixer. This was the era of the 5¢ cigar, and street paving was a far cry from today's methods.

February 2 the most important dates in 1957 to anyone who makes his living in the business or profession of roadbuilding," ARBA's executive vice president, Louis A. Prentiss, said in announcing program plans. "We are not only going to have a grand equipment show, but a high-powered program on down-to-earth engineering problems."

He cited 20 technical papers and 21 technical committee meetings and panel discussions as typical of the emphasis that will be placed on practical thinking at the convention.

Two major themes will dominate the convention program: 1) the market prospects for the industry in the years ahead, and 2) modern engineering techniques.

The technical sessions on almost every phase of road work will include discussions on rigid-type pavement design and slip-form paving, superhighway planning, highway lighting, techniques of photogrammetry, construction practices, roadside maintenance, steel bridge flooring developments, traffic control devices, winter maintenance, bituminous construction of heavy-duty pavements and county road administration.

County road engineers will be particularly interested in a major session on low-cost roads and at least seven papers on soil stabilization materials and methods.

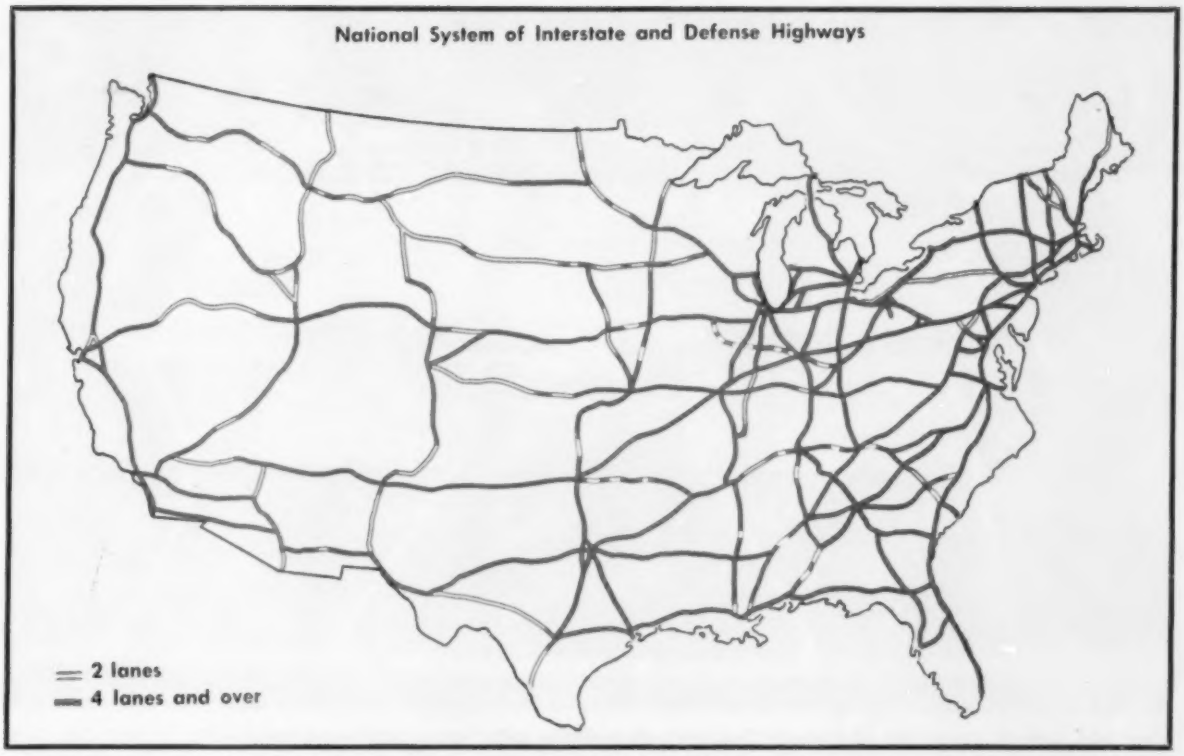
The newest techniques of planning, route location, and earthwork competition will be the theme of another general session. The practical use of aerial photography in route determination and of electronic computers to figure earth work quantities will be thoroughly reviewed by pioneers in these fields. Contractors, as well as engineers, will be represented in a discussion on the validity of electronically computed earthwork quantities for pay purposes.

Discuss Highway Bill

In two general sessions, congressmen and national highway figures will outline the job involved for the industry by passage of the long-awaited federal highway bill. Prospects for future federal and state financing will be discussed.

Here's a brief capsule of what the Highway Act of 1956 spells out:

Authorizes completion within 13 years of a national system of interstate and defense highways. This superhighway network is destined to become the backbone of America's 3.3 million mile road system. The project will cost an estimated $27.5 billion. Of this sum, the federal government will contribute $25



The 41,000-mile network of federal superhighways costing $27½ billion will be the largest roadbuilding job in history.

billion; the balance will be contributed by the states on a 90-10 matching formula.

Authorizes increased federal funds for new roads on the three regular federal-aid highway systems—primary, secondary and urban. A total of $2.55 billion of federal money will be spent during the first three years (1957-1959) on those roads. State governments will put out another $2.55 billion to match federal funds on a 50-50 basis. Thus, $5.1 billion will be spent on primary, secondary and urban roads during the next three years.

In addition, the federal government can be expected to continue its aid for the nation's roads beyond 1960. On the assumption that federal and state spending will continue over the entire 13-year period as during the first three years, then the overall expenditure for primary, secondary and urban roads will be $22 billion.

Also in the picture is the spending of local governments for roads. Current spending on the county and municipal levels is at the rate of $3 billion per year. If it continues at the same rate for 13

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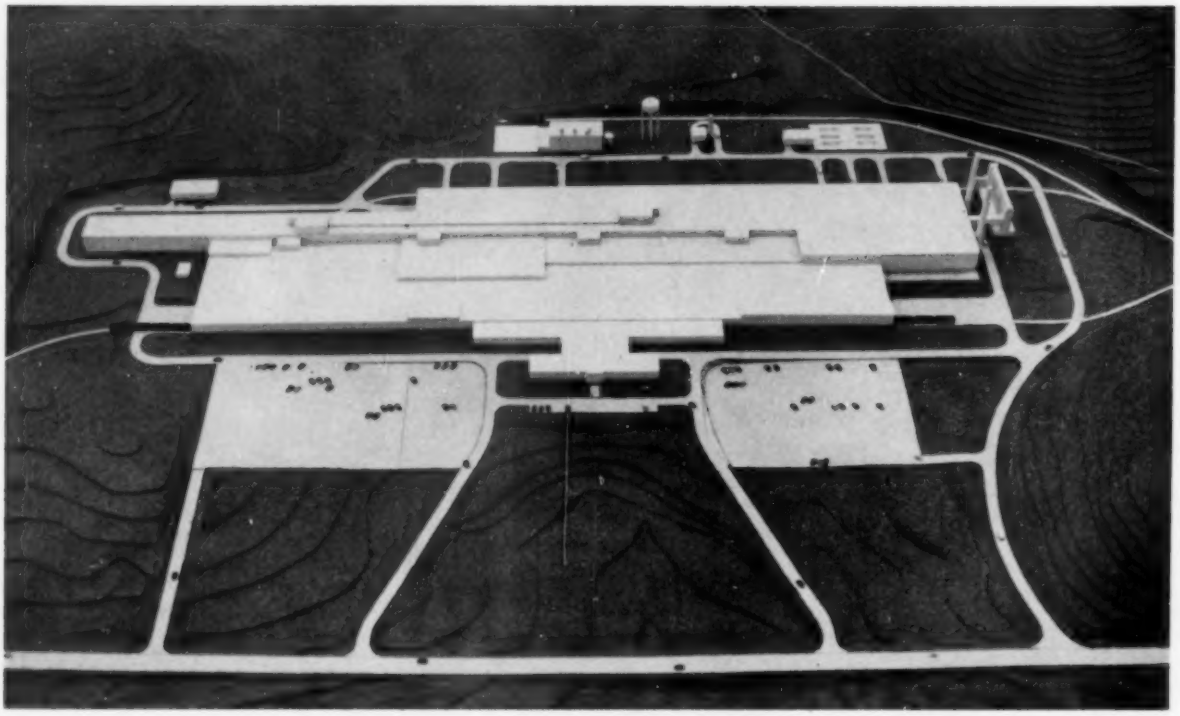
During recent paving of the Kansas Turnpike, a single contractor poured daily a half-mile of 10-in. concrete roadway 24 feet wide, using a pair of mixers.



Here is a scale model of the Ford Motor Company's multi-million dollar glass plant being constructed at Nashville, Tenn.

Ford Builds Sprawling Plant for Auto Glass

Multi-million dollar facility now under construction at Nashville, Tenn., will contain 1 million square feet of floor space. It will produce 400 tons — nine acres — of automotive glass daily.

One of Earthmovers' ¾-yd. dragshovels digs footings inside the plant. The main building and adjacent service facilities will have 1 million square feet of space.

GLASS for all product divisions of the sprawling Ford Motor Co. will start rolling off the lines of the firm's new multi-million-dollar glass plant at Nashville, Tenn., next year. The plant will double Ford's glass supply. Construction of the plant, located on a 237-acre site, began in the autumn of 1955.

The facility will consist of a one-story manufacturing building with an adjacent two-story office and employee service areas. The main buildings and adjacent service facilities will contain a total of approximately 1 million square feet of floor space. About 850,000 square feet of this space will be in the manufacturing building.

The exterior of the manufacturing building will be of corrugated aluminum siding and precast concrete panels. The office structure will be of brick.

Two melting furnaces will produce about 400 tons—nine acres—of automotive glass per day.

Auxiliary facilities such as powerhouse, water cooling tower, raw materials mixing building, pumping and clarification station and propane storage and handling facilities will be located adjacent to the main manufacturing building.

At full production, about 2,500 persons will be employed at the plant.

Thompson & Street Co., Charlotte, N. C., holds the prime contract for construction of the plant. W. P. Huffman is a project manager. C. D. Taylor is general superintendent.

All of the excavation work was subcontracted by Thompson & Street to McDowell & McDowell (Earthmovers, Inc.) of Nashville. Totals included 280,000 yards of rock excavation and 300,000 yards of common and borrow.

Earthmovers, Inc., also was to excavate 26,000 cubic yards of underground sewer, gas and acid waste lines and electric conduits. It used Traxcavators to excavate 6,000 yards for three twin mixing silos.

Shovels Handle Rock

Earthmovers started on the job in September 1955. It had completed the bulk of the excavation in December. By the end of April, 95% of the general excavation and 80% of the underground work had been completed.

General excavation was taken by scrapers, including four 18-yd. Caterpillar units — two DW21's and two DW20's—two 15-yd. Euclids and five 20-yd. Gar Woods pulled by Cat D8 tractors.

Three shovels were assigned to the rock excavation—a Bucyrus-Erie 38-B with a 1½-yd. bucket; a Northwest 80-D, 2¼ yards; and an 830 Lorain, two yards. Nine Euclid 12-yd. end dumps worked under the shovels.

Still active on the project during the spring on underground work were two Bucyrus-Erie 22-B ¾-yd. dragshovels and a Lorain 41 dragshovel. The 80-D, using a clamshell, was digging mixing pits, two of them 47 feet deep.

One Earthmovers official estimated that the firm shot $17,000 worth of dynamite on the project one month. Shooting was done on a basis of dislodging a yard of limestone for each three-fourths pound of Hercules dynamite used.

Drilling equipment included a 4½-in. Joy mounted on a D6 tractor; a 3-in. Gardner-Denver Air Trac; 12 Chicago Pneumatic and Gardner-Denver wagon drills for 2½-in. holes; about 15 Gardner-Denver and Chicago Pneumatic jackhammers; and 10 compressors—Chicago Pneumatic, Gardner-Denver and Le-Roi models.

When *Excavating Engineer* visited the plant in April, Earthmovers' two 22-B's were excavating for domestic water and fire lines. A D7 and two D4 dozers were back filling. At the peak of the operation, Earthmovers had seven or eight bulldozers on the job.

Two 10-hour shifts six days a week were operated for the rock excavation; a single 10-hour shift six days a week handled the common excavation.

J. P. Register is project manager for Earthmovers. Other officials on the job include: Roy Perryman, excavating superintendent; Jimmy Newby, rock superintendent; and Marvin Terrell, project engineer.

Sub-contracts for mechanical work on the superstructure, including excavation, such as plumbing, heating, air conditioning, sheet metal and process piping, were awarded to a joint venture composed of Wrenn Bros., Inc., Rock Hill, S. C.; W. H. Singleton & Co., Washington, D. C., and C. M. Gallagher & Co., Nashville.

Pipe for substructure work is handled by this crane in large warehousing area.

Wrenn had a separate sub-contract for furnishing and installing pipe for substructure work. Excavation for this work is being done by Earthmovers, Inc.

Approximately 26 miles of pipe, ranging in size from 24 inches in diameter

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A 15-yd. dump disposes of excavated rock. Plant will be opened next year.

A 600-cfm Gardner-Denver compressor provides air for a pair of wagon drills.

Fort Worth's Busy Concrete Supplier

by Floyd Suter Bixby

SIX ready-mix concrete plants, operated by Fort Worth Sand and Gravel Co., have done much to smooth construction progress in the Fort Worth (Tex.) area. Delivery trucks painted a distinctive orange and black shuttle between these plants and construction jobs where concrete is used.

These delivery trucks, and in turn the ready-mix plants, depend to a large extent on concrete aggregates supplied by a modern excavating and rock processing plant at Hurst, Tex. Known as the Quigley plant, it supplies graded gravel for almost any practical concrete mix. The plant is a part of the company's highly diversified building materials line which includes a concrete block manufacturing business. In company with the entire building industry, these facilities are helping greatly to let Fort Worth and nearby cities grow without materials shortages.

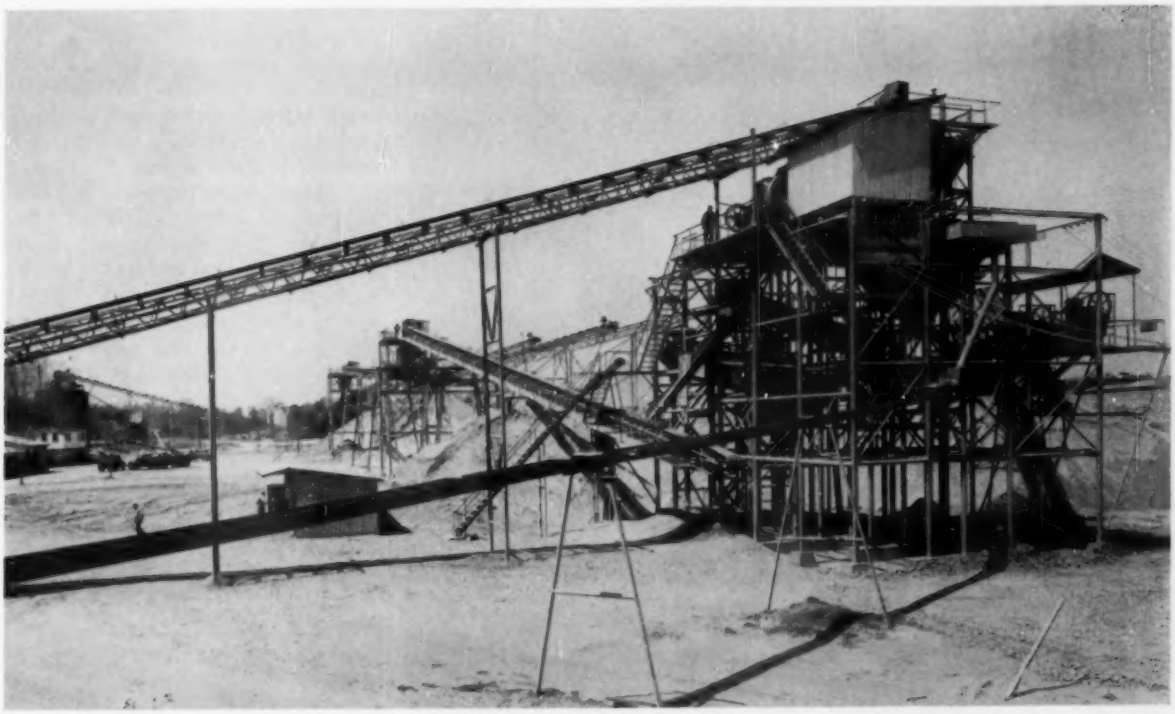
A 3-yd. dragline excavates gravel from the pit at Hurst, Tex., and loads to a waiting Euclid. The pit supplies concrete aggregates for all six of the firm's ready-mix plants.

A 28-ton load of pit-run gravel drops into the feeder hopper before entering the screening system. The Quigley plant processes 1,700 cubic yards of gravel per day.

The Quigley plant has recently been geared up for an average output of 1,700 cubic yards of sand and gravel per day five days a week. To meet this quota the screening plant has been enlarged and modernized and two new draglines have been purchased to strip and recover gravel deposits. A Bucyrus-Erie 54-B was purchased for the stripping operation; gravel recovery was planned for a companion Bucyrus-Erie 51-B.

The Quigley plant is a supply center for concrete aggregates which go to company-owned ready-mix plants in Fort Worth, Hanley, South Side, Ridgley, Arlington and Hurst. The Hurst ready-mix plant is operated in conjunc-

Texas firm operates high production plant to supply aggregates for its products.



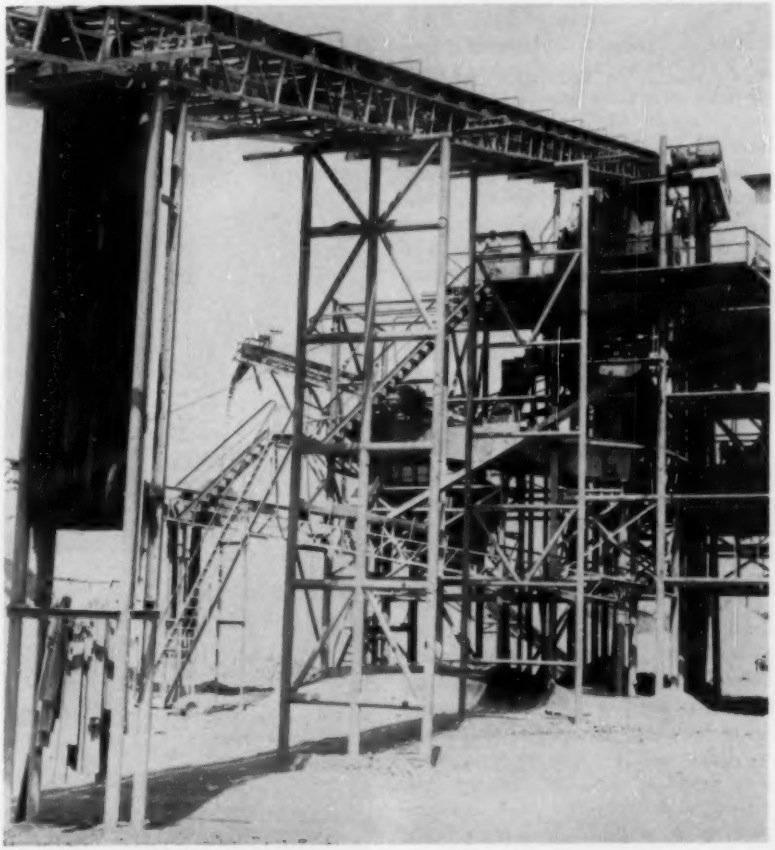
Here's a view of the processing setup with stacker conveyors in the background. Steel flume in foreground carries waste water.

tion with the aggregate plant and, like other ready-mix locations, has its concrete orders coordinated by radio from the company's headquarters on East 6th St. in Fort Worth. The coordination of materials orders over this 40-mile-diameter area by a central dispatcher is an important factor in better efficiency, according to company officials, particularly in view of the firming-up of production at the Quigley plant with new equipment.

President Ralph B. Rogers of Texas Industries, Inc., set the pattern for such a policy in the 1955 annual report, which explained, "Sales for the year increased 34.8%. Profits before taxes increased 133%. Profits after taxes increased 110%. These increases resulted primarily from improvement in operations, rather than from acquisitions as in former years, which underscores the importance of continuing and intensifying our efforts in this direction. . . ."

While President Rogers' message referred to Texas Industries, Inc., as a whole, his words were particularly appropriate in the case of the Quigley plant of Fort Worth Sand & Gravel Co., Inc. "Improvement in operations" has been such a guiding policy here that the plant has won both safety and efficiency awards on a national scale.

The gravel-production area operated in connection with the Quigley plant



Weighted belt tensioner, shown at left, is used on all main conveyors. Purpose is to keep belts under proper tension either loaded or empty; it saves up to 40% belt wear.

(Above) This venerable Bucyrus-Monighan 3-T dragline was recently replaced by a new 54-B. (Below) Gravel uncovered by the old 3-yd. unit is ready for loading.

lies entirely within the Trinity River bottom. In ages past, as the river meandered over the valley floor, it left a fairly clean gravel stratum 6 to 8 feet deep. Erosion and stream behavior in more recent times has covered this gravel with a layer of overburden, chiefly clay and silt. This overburden is from 8 to 12 feet deep. Normal water level in the valley bottom lies near the bottom of the gravel zone, so that stripping conditions do not require the use of mats.

Averages 50% Gravel

The native gravel averages out at about 50% sand and 50% gravel from No. 4 through 3-in. sizes. Practically 100% of this material can be used. The only rejects are a few oversize gravel boulders which show up rarely. These are removed at the plant's first scalping screen so that aggregate manufacture is a screening, rather than a crushing, assignment.

In the early years of the Quigley operation, stripping and loading were handled by a venerable old Bucyrus-Monighan 3-T, carrying a 3-yd. bucket, and by a pair of 1½-yd. Northwest Model 6's. Early in 1956, the company purchased a Bucyrus-Erie 54-B dragline, powered by a Buda diesel engine. The machine was equipped with a 60-ft. boom and a 3-yd. Hendrix perforated lightweight dragline bucket for handling the yellow sandy clay and black gummy dirt overburden. A Northwest Model 8, which the company purchased used and is overhauling, and the 54-B replaced the old Monighan.

To handle gravel loading at high rates of speed, the company purchased a Bucyrus-Erie 51-B dragline, also Buda-diesel powered, and equipped it with a 60-ft. boom and a 2½-yd. Hendrix bucket of the same type as the one on the 54-B. These buckets load easily and, if material is waterlogged, permit excess water to drain off during the swing over to the hauling trucks.

Because borings have shown the gravel-bearing areas to be irregularly shaped, stripping is handled in an unusual way. The first cut is usually made right down through the center of an area where the deposit is widest and the cut is of maximum length. Cuts up to 4,000 feet long have been made in the biggest deposits; but sometimes they cramp down so that both machines, working in close quarters, have to load *and* strip.

By pulling the center cut out first where the deposit is biggest, the maxi-

mum size trench is dug from the outset. This stripping is cast, let us say, to the north side of the cut. The next cut is then made to the south, and stripped overburden is dumped into the trench left after overburden and gravel have been removed.

This method then continues on cut after cut, with the machines feeling their way when they get to the end of the gravel-bar deposits. They stop where the gravel peters out, leaving the area completely explored. After one half of an area has been mined, the other half can then be handled. On the second half it is necessary to rehandle the stripped dirt from the first cut.

On an average shift's digging, the 54-B handles about 2,500 cubic yards of material on cycles of 90° swing. It has never been necessary to rip or loosen the overburden, because it is fairly easy to dig. If any brush clearing is necessary, it is taken care of by a Cat dozer.

The 51-B dragline, working on gravel loading, dumps its bucket to the beds of three 28-ton Euclid bottom dump units, which haul over a company-owned and maintained gravel road leading from the present pit about three miles away from the plant site. The haul road is maintained by a Caterpillar motor grader. Private vehicles are posted off-limits on this trafficway. That permits the Eucs to operate at top speed, so that three machines can keep the 51-B dragline fairly busy. The Quigley plant requires much gravel every day. A steady, productive operation is needed to feed in 1,700 cubic yards over its screening and washing system. The haul between pit and plant is slightly upgrade all the way.

Driver of a truck mixer keeps in touch with central dispatcher via Motorola communications system. Concrete trucks serve a wide, booming construction market.

Modern Processing Plant

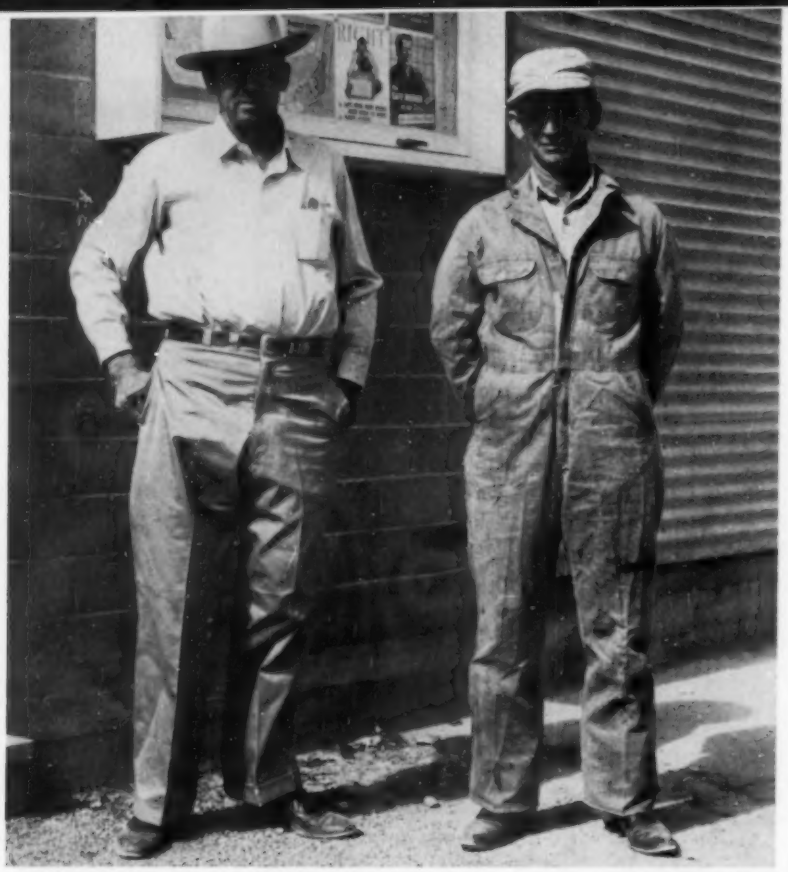
Pit-run material dumped by the Eucs is passed through the modern plant to wash away all the clay and dirt which leached down over the gravel in years past, and to grade or size the particles remaining.

The bottom-dump Eucs drop their loads through a grizzly, set flat into a 120-yd. reinforced concrete receiving hopper 36 feet long and 24 feet wide. A Telsmith double-eccentric plate feeder, 30-in. size, keeps an even load of raw material moving onto a 30-in. conveyor 245 feet long. This conveyor, moving 375 fpm with the aid of an electric motor, can carry 245 tons per hour to the top of the classifying tower which forms the heart of the plant.

Before the material enters the first sizing units it passes over a Cedarapids 3x8-ft., double deck, horizontal vibrating screen. The top deck is equipped with 3-in. mesh, so that any oversize gravel can be scalped off and stored temporarily in a 21-yd. surge bin, until it can be hauled away.

The first sizing unit is a Telsmith 8x20-ft. revolving screen, with a 4-ft. scrubber section. This equipment has a No. 8 outside sand jacket to remove sand through square openings. At the head of this revolving screen, 750 gpm of water are applied, for washing and separation. The inside barrel of the screen is 5 feet in diameter, 16 feet long, and has a ⅜-in. diameter round perforated screen. This passes the sand on to the woven-wire sand jacket, but retains all the large material so that there is no excessive wear on the sand jacket except what the sand itself imposes.

Next in line is a 10 x 20-ft. Eagle water scalping tank. It has several pur-



Supt. Howard Rowland (right), and Foreman Carl Roland pause in front of the Quigley plant's safety bulletin board. The plant has won many safety awards.

poses in handling sand throughs from the No. 8 screen. First, it removes part of the 30% water content the sand contains at this stage. Second, it classifies sizes and disposes of any undesirable material. Third, it retains the fines in its large settling area, so that fine sand can be discharged through the gates into the fine material screws.

Two Eagle fine-material screws can handle 300 tph if necessary, since one is a 36-in. x 25-ft. single; the other a 30-in. x 25-ft. double. An additional 100 gallons of fresh water is added to each sand screw with the sand input for rewashing and final cleaning and dehydration. Both screws move the sand to a 24-in. conveyor belt 126 feet long, which stacks the material 55 feet high over a reclaiming tunnel.

Washed gravel from the scrubber is split, part going into a 24-in. x 24-ft. double material screw, and the balance going into a 36-in. x 25-ft. Eagle log washer. The latter has 60 to 85 tph capacity; the former has 150 to 180 tph capacity. A flop gate regulates the flow of material between the two machines. Another 300 gpm of water are added to this material here, principally for rewashing, dehydrating and floating out of sticks and roots. Extra water

Continued on page 41

A 2½-yd. dragline removes overburden. Spoil banks of stripped soil are later levelled by a dozer to reclaim the land.

EDITORIAL

Will New Roads Save Live

With the nation's highway death tolls rising year by year, the new Federal Intering Act offers a strong ray of

41,000 miles of new expressway be built. They will be wider, st safer roads. Crossings will b eliminated. If speeds are sen will be fewer acci

IKE SIGNS BIGGEST ROAD BILL EVER

Washington, D. C., June 29. Among some 50 bills signed by the President today was the $32,900,000,000 Federal Interstate Highway Aid bill

ONE GOAL

Since 1949, Caterpillar, your partner in earthmoving progress, has campaigned for better highways

41,000 MILES

OF NE

ON T'

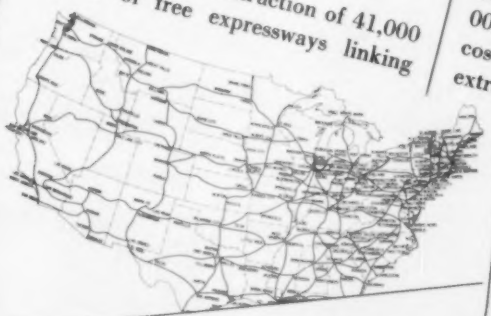
Washingto President

GIANT ROAD BILL SIGNED

$32.9 BILLION HIGHWAY BILL GETS GREEN LIGHT FROM IKE

Washington, D. C., June 29—The largest public works program in history was signed into law by President Eisenhower today.

It calls for construction of 41,000 miles of free expressways linking



practically every large city and state capital in the nation. The building will take 13 years and cost $32,900,000,000. But the huge program will cost the average driver extra

$33 Billion Highway Bill OK'd by Ike

Washington, D. C., June 29. President Eisenhower today signed into law the Federal Interstate Highway bill, largest public works program in history. It provides for Federal expenditures of $32,900,000,000 to build 41,000 miles of superhighways next 13

9500 LIVES SAVED

There were many good and compelling economic reasons for President Eisenhower to sign the

victim roads

Ro

IKE APPROVES BILLIONS FOR NEW HIGHWAYS

Georgia's Share of Highway Funds Over $800 Million

Washington, D. C., July 2. The Government will spend $838,700,000 for highways in Georgia during the next 13 years, according to

March, 1949 | November, 1949 | January, 1950 | February, 1950 | September, 1950

November, 1950 | February, 1952 | June, 1952 | September, 1952 | November, 1952

February, 1953 | March, 1953 | May, 1953 | September, 1953 | October, 1953

November, 1953 | January, 1954 | February, 1954 | May, 1954 | June, 1954

Early in 1949, Caterpillar Tractor Co. began a series of full-page 4-color advertisements in *The Saturday Evening Post* and other national magazines. These pages were designed to forcefully awaken the public to the frightful toll of lives and money taken yearly by inadequate roads.

The 40 advertisements, reproduced in miniature above, give some idea of

January, 1955

February, 1955

March, 1955

April, 1955

May, 1955

July, 1955

September, 1955

October, 1955

November, 1955

December, 1955

January, 1956

February, 1956

March, 1956

April, 1956

May, 1956

June, 1956

July, 1956

August, 1956

September, 1956

October, 1956

the continuing impact carried by this campaign. In the last two years emphasis has been changed to show how various states are meeting the highway problem.

With a strong awareness of highway needs now in the public mind, the new Federal Interstate Highway Program has been enacted into law. The next two pages show a breakdown of probable highway expenditures by states.

Ala. $730,800,000

Ariz. $424,200,000

Ark. $529,000,000

Cal. $2,019,600,000

THE NEW INTERSTATE HIGHWAY SYSTEM AND PROPOSED FEDERAL AID TO STATES

These are the estimated Federal grants to states for the next 13 years, to be used for both the Interstate Highway System and other Federal-Aid roads.

These figures represent 90% of the cost for the Interstate System, 50% for the remainder.

Minn. $829,600,000

Nev. $371,100,000

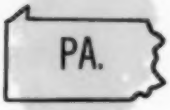
N.H. $204,800,000

N.J. $753,900,000

N.M. $450,700,000

Okla. $661,200,000

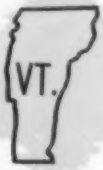
Ore. $507,900,000



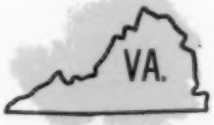
Pa. $1,865,800,000

R.I. $216,400,000

Utah $351,900,000



Vt. $201,200,000



Va. $718,400,000

Wash. $582,000,000

Col. $518,300,000

Conn. $342,500,000

Del. $202,200,000

Fla. $608,400,000

Ga. $838,700,000

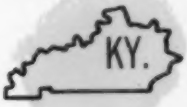
Idaho $364,300,000

Ill. $1,668,500,000

Ind. $872,100,000

Iowa $751,300,000

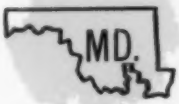
Kan. $683,300,000



Ky. $666,900,000

La. $588,500,000

Me. $284,400,000



Md. $418,700,000

Mass. $735,700,000

Mich. $1,277,600,000

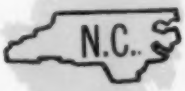
Miss. $574,000,000

Mo. $986,400,000

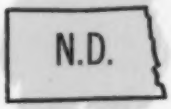
Mont. $539,000,000

Neb. $544,100,000

N.Y. $2,469,500,000



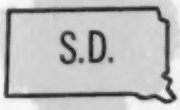
N.C. $903,500,000



N.D. $406,900,000

Ohio $1,509,300,000

S.C. $476,900,000



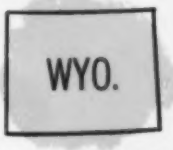
S.D. $427,700,000

Tenn. $766,800,000

Texas $2,112,500,000

W.Va. $418,200,000

Wisc. $822,600,000



Wyo. $369,900,000

D.C. $220,900,000

CATERPILLAR—
your partner in earthmoving progress—
has the equipment ready for the big job

The mighty D9, with 320 Turbocharged engine HP and No. 9S Loadshape Bulldozer, heads the line of six Caterpillar crawler Tractors. The other machines, with engine HP, are: D8—191 HP, D7—128 HP, D6—93 HP, D4—63 HP, and D2—48 HP.

The Turbocharged 300 HP DW21 with the 25 cu. yd. (heaped) capacity No. 470 LOWBOWL Scraper provides a fast, highly maneuverable earthmoving unit.

The No. 977 Traxcavator of 2¼ cu. yd. bucket capacity is the largest of the three Cat-built tractor-shovels. The No. 955 has a 1½ cu. yd. bucket; the No. 933, a 1 cu. yd. bucket. Lift forks and other attachments give added versatility to these highly productive units.

The No. 8 Ripper, for use with the D8 Tractor, is one of a line of five Cat-built tractor-mounted rippers. In addition to the No. 8, they are: the No. 9, the No. 6, the No. 4 and the No. 2 for use with other Caterpillar-built Tractors and Traxcavators.

The four-wheel DW20, with Turbocharged 300 HP Cat Engine, teams up with the LOWBOWL No. 456 Scraper (25 cu. yd. capacity) for high-speed earthmoving on longer hauls. The four-wheel 186 HP DW15 works with the No. 15 Scraper (12½ cu. yd. capacity).

Representative of the Cat four-wheel, crawler-drawn Scraper line is the No. 463. Heaped capacities are: No. 90, 27 cu. yd.; No. 463, 25 cu. yd.; No. 70, 15 cu. yd.; No. 60, 9 cu. yd.; and No. 40, 4.5 cu. yd.

Caterpillar Electric Sets are available in eight basic models ranging from 30 to 350 KW. Available in portable units, they are a reliable and convenient source of electric power.

Nine basic sizes, from 65 to 650 HP, make up the line of Caterpillar Diesel Engines. They are used by over 100 manufacturers to power excavators, compressors, crushers and other construction machines.

Heading the line of three Cat Motor Graders is the 115 HP No. 12. The No. 112 has 75 HP; the No. 212 has 50 HP.

N. J. GIRDS TO PUSH ROAD CONSTRUCTION

Highways Officials and Senators Confer on Possible One-Cent Gas Tax Rise

Trenton, June 29. The ex- | tion, according to state high- | a 90-10 basis for interstate
way officials here. New Jersey | roads, and one-third on a 50-50
basis to finance primary, sec
ondary and urban roads. Th

41,000 Miles of Super-Highways i New Federal Bill

Next year—and the years ahead—offer you the greatest challenge in the whole history of construction. The highway work alone will dwarf any previous undertaking.

Caterpillar has been preparing for this time. Plant capacity has been doubled and is still expanding. New and improved products are now in full production, giving you equipment designed and built to do more work, faster, at lower cost. When you bid on a contract, that kind of equipment can make the difference between profit and loss.

Caterpillar leadership is leadership *in action*. It never stands still. The full resources of Caterpillar research, both in the laboratory and right in the field with you, are constantly devoted to the development of even more efficient engines and earthmovers—equipment that keeps pace with your increasing opportunities.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Tractovator are Registered Trademarks of Caterpillar Tractor Co.

YOUR PARTNER IN EARTHMOVING PROGRESS

STATE TO GET $230 MILLION IN FEDERAL FUNDS BY 1959

Illinois Total Over $1½ Billion for 13-Year Highway Building Era

Washington, D. C., July 3. Estimates released by the U. S. Bureau of Public Roads call for $229,700,000 of Federal ... funds to be spent in Illinois in three years, starting July 1, 1956.

This represents 90 per cent of Interstate road construction costs. The state will furnish the additional 10 per cent. For the full 13-year period covered by the Federal Highway bill it is estimated Illinois will receive nearly $1,700,000,000.

41,000 MILES OF HIGHWAYS APPROVED BY PRESIDENT

Washington, D. C., June 29—You're going to get 41,000 miles of new four, six and eight lane highways in the next 13 years.

It became official today when President Eisenhower signed the Federal Interstate Highway bill. Under the new law, the Federal government will spend $32,900,000,000 through 1969 for the new roads.

The bill calls for a vast network of free superhighways linking most major cities and state capitals.

HIGHWAY BILL BOON TO UTAH ROAD SYSTEM

Salt Lake City, July 3—Over-all spending in Utah for highways in the next three years will rise from $25.2 million to $88.6 million. And for the succeeding 10-year period it will continue in the $75 to $95 million bracket.

This will result from the new 13-year road building program signed into law by President Eisenhower. By 1970 Utah will be criss-crossed by splendid four and six lane divided highways.

The state now has some 700 miles of interstate highways and the bill provides for a rebuilding of an amount equal to this mileage.

$32.9 Billion Highway Bill a Bargain for Car Owner

New Taxes on Gas, Tires to Cost Average Driver Only $8.60 per Year

Washington, D.C., July 2. The Federal Highway Aid bill, which has been high on the President's list of must legislation, is now law. As high- ... authorities have pointed ... program for

It is a pay-as-you-go program. But the $33 billion total, to be paid for by a 1-cent increase in the gasoline tax, 3 cents a pound for tires and a 2 per cent rise in the price of trucks, buses and trailers, will result in safer, more economical driving. The average car owner will pay only $8.60 a year, and should save much more than that in fuel, time, ... tires, and,

Fort Worth . . .

Continued from page 32

applied at this stage will even separate shale from gravel.

Purpose of the log washer, which works on larger aggregates, is to remove or disintegrate certain cemented aggregates, tough insoluble clays, conglomerates and soft stone. Massive paddles in the log washer hold the material under tough, cutting abrasion for a long period of time. It will clean the dirtiest of gravels. Sometimes the material is extremely heavy in clay-coated particles. At such times less water is used in the washer so that abrasive action is built up. The eroded clay then is removed by a spray bar at the discharge end.

Gravel Discharged

The coarse-material screw and the log washer both discharge to No. 1 gravel conveyor, a 24-in x 204-ft. belt traveling 350 fpm. This belt connects the classifying tower to No. 1 screen tower. Mounted in No. 1 screen tower is a Tyler Tyrock 4 x 10-ft. double deck shaker screen with 1¾-in. square openings on the top deck and ¾-in. square openings on the bottom. The sizes from 3-in. to 1¾-in. and from 1¾ to ¾-in. are taken off here and conveyed to points over reclaiming tunnels.

Remaining material is conveyed to No. 2 screen tower, where another Tyrock 4x10-ft. screen does similar sizing, separating ¾ to ½-in., ½ to ¼-in., and ¼-in. to No. 8. These materials are then stacked separately over reclaiming tunnels. When all the stockpiles are full, the company has about 70,000 cubic yards of concrete materials available.

The reclaiming tunnel, 6 x 6 x 465 feet in size, has adjustable bin gates every 10 feet for loading out, charging or blending. Any reasonable specification can be met by feeding various amounts of the different sizes to the reclaiming and tipple conveyors. The plant has an eight-compartment, 650-ton loading-out bin, which can load railroad cars through chutes alongside its bins. Trucks are loaded from a haul road underneath. Up to 200 cubic yards an hour can be loaded out. The office, tunnel and loading-out plant are connected by an intercom system for rapid, efficient communication.

Fort Worth Sand & Gravel Co. operations are under the general supervision of C. E. Marshall, head of the company's concrete division, with Howard Rowland as Quigley plant superintendent.

It pays to order wire rope a little longer than necessary for your equipment.

How to Slow Down Rope Wear

TO lengthen the life of wire rope used on cranes and excavators, the Wickwire Spencer Steel Div., Colorado Fuel and Iron Corp., Palmer, Mass., makes the following suggestions:

1. Shift the rope periodically to distribute wear.
2. Reverse the position of the rope on the drum.

According to Wickwire engineers, wire rope used for hoisting is usually subjected to the most severe wear at two or three critical points along its length. As a result, these spots wear out prematurely and make rope replacement necessary even though the major portion of the rope may still be serviceable.

These points of critical wear include that portion of the rope in contact with the sheaves as the load is picked up, and also that point of the rope which winds on the drum as the load is accelerated. The section of rope which contacts the drum flange and rises to the next layer on the drum in multiple layer winding is also subject to excessive wear and distortion.

Rope Slippage

The reason for the greater degree of wear on the rope in contact with the sheaves is that during the pick-up period the rope speed is being increased, and this acceleration may cause slippage between the rope and the sheave. This acceleration also increases the tension in the rope and this in turn increases the radial pressure between the rope and the sheave, causing greater pressure and rope wear.

A practical approach to distributing such severe wear over a longer length of rope is to shift the rope during its life. This may be accomplished by purchasing slightly longer rope than required in the beginning so that as the rope is used, a precalculated length can be cut off periodically. This will advance the rope so that those sections that have not previously been subjected to severe service will now be placed in those spots subject to greatest damage, and those portions which have been subjected to severe wear will be moved on to an area of lesser wear.

Reversing Method

Another method occasionally followed on some operations, which will distribute wear, is to reverse the rope. This involves detaching the rope from the drum and making the drum-end the load-end and vice versa.

This, however, will not result in greater service if the point of greatest wear is near the midpoint of the rope. Reversal of the rope under such condition would not change the position of the point of greatest wear, and so would not be of benefit.

News from the Field

A Manitowoc 4500 dragline dredges silt and blasted rock from the bed of Kentucky's Green River. Great Lakes Dredge & Dock Co. is deepening the channel for barges.

Technical School Opens

Greer Technical Institute, 2230 S. Michigan Ave., Chicago, Ill., opened an earthmoving school in October at Braidwood, Ill. The course was instituted in anticipation of an acute shortage of experienced construction equipment operators when the new interstate highway program begins.

The school is located on a 600-acre tract, 20 miles south of Joliet. Men will be taught to operate a complete line of International Harvester earthmoving and motor truck equipment. International Harvester has manufacturing and service facilities located close to the school.

Three courses are planned: 1) operation and maintenance of crawler tractors, dump trucks, loaders and scrapers; 2) operation of motor graders; and 3) all-inclusive instruction covering all machines.

Deepen River for Barges

Kentucky's Green River flows northwest from Mammoth Cave National Park, passing through some of the rich coal fields in the western part of the state before emptying into the Ohio River a short distance above Evansville, Ind.

The Green River has never been able to accommodate coal barges large enough to serve the needs of the communities along the Ohio River. While the Ohio River could take barges drawing up to 9 feet, Green River barges could draw only 5½ feet.

Last summer, the U. S. Corps of Engineers began widening and deepening operations that would enable the Green River to meet the traffic demands of the Kentucky coal producers. Working from 100 to 150 miles upstream, approximately 450,000 yards of rock and earth were moved at a rate of 3,500 yards daily. Contractor on the job was the Great Lakes Dredge and Dock Co., Chicago, Ill. A large barge-mounted dragline dredged silt and blasted rock from the riverbed. The material was scowed and disposed of in the deeper sections of the river. There are sections of the river so deep that it has been titled "the deepest small river in the world."

The project also included the building of two locks, 85 x 800 feet in size. They are located at Spottsville and Calhoun, both near the mouth of the river.

"Well, gentlemen, who was awarded the contract?"

Fill Federal Highway Post

John A. Volpe, who recently resigned as commissioner of public works of Massachusetts, has been named interim federal highway administrator by President Eisenhower. Bertram A. Tallamy, chairman of the New York Thruway Authority and former superintendent of

Continued on page 44

Four work speeds, 1.8 to 6.4 mph, provide the best power and speed for each particular job assignment.

Today's big news in motor graders

is the all-new 60 hp ADAMS "220"

Here is a low-priced grader with big capacity for hard work. Weighing 14,865 pounds, powered by a 60 hp diesel engine, "220" handles many jobs done by larger machines, saves you money on general grading and road maintenance. Big in value, Adams "220" out-works, out-maneuvers any grader in its size and price class.

Works like a big machine

Like the larger Adams machines, the "220" has 4 working speeds under 6.5 mph, and 4 optional "creeper" speeds for full use of engine power in slow, rugged, or precise work. Travels job-to-job up to 18.3 mph.

Blade controls are straight-line-thrust hydraulic. Moldboard swings from ditch-cut to 90° high bank-cut, on either side of grader, in less than a minute, without operator leaving cab. 10-ft. slide-shift moldboard has 6 pitch positions, and reaches 54½" outside wheels. Leaning front wheels, hydraulically operated, offset side thrust, make short turns possible. Wide tread (76" front, 77" rear) gives stability, safety, and easy handling on slopes.

Built like a big machine

"220's" big 10:00 x 24 tires on all six wheels give firm footing and minimum rolling resistance. Sturdy 4-wheel tandem-drive utilizes full engine power, provides push-power and traction for doing many of the heavier jobs. Rugged diesel engine is cranked electrically, starts quickly in all seasons.

Optional cab, open or enclosed type, has 6'4" inside height, floor to ceiling, without use of "foot wells".

Operator controls blade movement from cab, swings moldboard ditch-cut to 90° high bank-cut on either side of grader, in one continuous motion. Exclusive gear assembly multiplies hydraulic ram action, 3 to 1.

Sturdy one-piece, rectangular-welded-section frame, and strong Y-shape drawbar, withstand punishing shocks and stresses. Arched frame provides 17" blade clearance to clear shoulders when climbing out of ditch.

Anti-friction steering, and smooth, fast-acting hydraulic brakes give operator confidence to work or travel at highest practical speed.

Scarifier, power-shift moldboard, 12' moldboards, cab, and other accessories, available as optional equipment.

See Adams in action

We will be glad to prove to you that "220", as well as larger Adams graders, work harder, faster, and at lower cost than other graders of similar size and power. Why not call or write and ask for a competitive demonstration?

Model 220	60 hp	14,865 lbs.
Model 330	80 hp	20,500 lbs.
Model 440	104 hp	21,500 lbs.
Model 550	123 hp	23,500 lbs.
Model 660	150 hp	27,730 lbs.

AG-44-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

News . . .

Continued from page 42

public works for New York State, is slated for nomination by the President to take over the post in January, subject to confirmation by the Senate.

The federal highway administrator, a key sub-cabinet administrative job, was created in the Federal Aid Highway Act of 1956.

ASCE Names Committees

The committee on masonry and reinforced steel concrete of the structural division of the American Society of Civil Engineers has moved toward wider participation in development of information on new fields in reinforced concrete. Four committees were appointed to report on recommended practice in four rapidly-developing fields of design and construction.

Alfred L. Parme of the Portland Cement Assn. Chicago, Ill., heads a committee on limit design. It will study readjustment of moments in frames and other indeterminate structures due to plastic action. This study is regarded as needed to supplement the recent ASCE-ACI joint committee report on ultimate strength design.

Jack R. Janney, Chicago consulting engineer, was named chairman of a committee on precast structural design and construction. A third group, with Dr. Ivan M. Viest, University of Illinois research professor, as chairman, will examine interaction of concrete decks on steel, timber and precast concrete supporting members. Albyn Mackintosh, Los Angeles (Calif.) consulting engineer, is chairman of a committee on reinforced masonry design and construction named to develop recommended practice for reinforced masonry construction, including brick, tile and concrete, a type of construction highly important in areas subject to earthquakes.

The nation's widely-heralded interstate highway system was discussed at the ASCE convention in Pittsburgh, Pa., in October.

"Practically nothing has been said about the plans required before all this is a reality," said Richard A. Haber, chief engineer of the Delaware State Highway Dept. "Few writers seem to realize that work on the present highway system must continue and, in fact, increase as the interstate system will change and influence the traffic pattern."

Haber said that highway engineers, however, "are well aware that plans come first and they are spending a lot of extra hours trying to develop methods of saving manpower and time in their preparation." He felt that "under the present pressures we seem to be in a position of getting quantity or quality, but seldom both," but added that "both can be attained by a process of simplification and both must be attained if we are to meet the demands and at the same time maintain our standing as a profession."

Coal Pipeline Completed

Work has been completed on the nation's first commercial coal pipeline. The unique 10-in. pipeline extends 108 miles from the Pittsburgh Consolidation Coal Co. mines near Cadiz, Ohio, to the Cleveland Electric Illuminating Company's East Lake steam power plant, east of Cleveland on Lake Erie.

Work on the line was completed at the rate of 2½ miles per day by Williams Bros., Tulsa (Okla.) pipeline contractors. (The accompanying photograph shows a Cleveland 320 trencher working on the project.)

Pittsburgh Consolidation and CEI embarked on the $12 million project after six years of research. The coal will be pulverized as it comes from the mine, mixed with water and pumped through the line as "slurry" to its destination where it will be dried and processed. The pipeline will supply more than 1 million tons of coal per year to CEI's generating plant, about 80% of its fuel requirement.

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BENTONE-34®

NO REPLACEMENT OF ANY LUBRICATED PART *IN 5 YEARS!*

"Cut Lubrication Costs 25% With Bentone* 34 Based Grease !"

If you use grease made with Bentone* 34 you can get the same surprising savings made by Cleveland Stevedore Company, Cleveland, Ohio. *Five years ago they put a new shovel to work handling abrasive limestone. In five years of rugged use, not one lubricated part has required replacement!* Their cost figures show a saving of 25 per cent on lubrication, because they use only a grease compounded by using Bentone 34. The heavy-duty ring gear needs lubricating only once a month. Specify Bentone 34 greases on your equipment and cut maintenance costs.

FIVE WAYS YOU SAVE WITH BENTONE *34 GREASE

1. Will not melt.
2. Repels water.
3. Adheres to metal.
4. Pumps easily.
5. Less consumption.

BENTONE* 34
FOR MULTI-PURPOSE GREASE

Dutch Boy * TRADEMARKS REGISTERED

For additional information contact your local supplier as listed on adjoining page or write

NATIONAL LEAD COMPANY • BAROID DIVISION
P. O. BOX 1675 HOUSTON 1, TEXAS

Equipment You Ought to Know About

35-Ton Dart Dump

Manufacturer: Dart Truck Co., 27th & Oak Streets, Kansas City 8, Mo.

Claims: Dart is producing the new Model 35SL 35-ton end dump truck which carries 24 cubic yards struck. Its rear tires are 18:00 x 33, 32-ply, and the front tires are 18:00 x 25, 32-ply.

The truck utilizes a 400-hp diesel engine driving through a down-hill retarding torque converter and a special design, heavy-duty three-speed transmission.

The cab is designed for entirely automatic air conditioning if it is desirable. Dart's tubular 25-ton front axle and its triple reduction planetary 55-ton driving axle far exceed the gross vehicle weight of 63 tons.

Stripping, Quarrying Explosive

Manufacturer: Atlas Powder Co., Explosives Div., Wilmington 99, Del.

Claims: Atlas has announced a new-type stripping and quarrying explosive called Amocore. It consists of a basic cartridge charge of Amocol, Atlas' ammonium nitrate blasting agent, with a gelatin core.

The gelatin core, which runs throughout the length of the cartridge, appears to promote the development of full ingredient strength, providing a more efficient explosive. This fact is evidenced in its action by a reduction of red fumes usually visible during ammonium nitrate blasts. Red fumes indicate incomplete detonation.

Like conventional ammonium nitrate blasting agents, Amocore must be detonated with a high explosive primer. Unlike conventional blasting agents, however, the continuous gelatin initiator insures complete detonation and eliminates the need for intermediate high explosive booster charges placed at regular intervals throughout the explosives column in order to maintain detonation.

Because a detonating fuse alone may not explode it, holes loaded with Amocore can often be detonated at the point of maximum confinement by a high explosive cartridge primed with detonating fuse.

The gelatin core also appears to improve the water resistance of the blasting agent. Wet holes have been successfully fired at a number of operations, but no standards of water resistance for this product have yet been established.

Amocore is available in 25 and 50-lb. cartridges 5 inches or greater in diameter.

Bigger Capacity Trenchliner

Manufacturer: Parsons Co., Newton, Iowa.

Claims: Parsons has announced an increase in digging capacity to 10-ft. depth for its Model 155 general utility Trenchliner. The change does not affect the Model 155's range of digging widths of 16 through 26 inches.

The Model 155 is 7 feet 4 inches high and 5 feet 4 inches long. It is capable of producing 5.8 inches to 12.75 lineal feet of trench per minute. It operates with a range of 30 digging speeds selected by lever control.

Mining Rock Drill

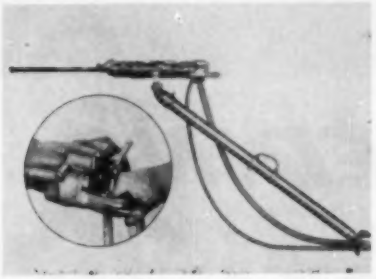
Manufacturer: Atlas Copco Eastern, Inc., 151 Linwood Ave., Paterson, N. J.

Claims: Atlas Copco AB has an-

nounced the development of a high capacity mining and tunneling rock drill and an automatically-retracted semi-integral pusher leg designed for simplified one-hand operation.

Called the "Lion," the unit can drill up to 90 feet in depth at an optimum rate of 2 fpm in granite.

Controls for operating both the drill and the semi-integral pneumatic pusher are located on the "Lion's" back head. Opening the throttle simultaneously feeds air to the pusher to raise the drill, applies the flushing water and starts impact and rotation actions.



Producing 2,000 blows per minute, the 65-pound drill operates at a pressure of 85 psi from a single 1-in. air line. Piston bore and stroke is 2¾ inches. The drill's rotation chuck is designed for ⅞-in. hexagon 4¼-in. collared shanks. Standard rotation is on the return stroke, but the "Lion" also is convertible to downstroke rotation.

Flushing and blowing are done through a large concentric axial tube, water from the ½-in. supply line being controlled by linkage to the drill's throttle.

Cummins-Powered Graders

Manufacturer: Huber-Warco Co., Marion, Ohio.

Claims: Cummins diesel-powered units have been added to the Huber-Warco line of 6-D and 7-D series motor graders with torque converter and full power shift transmission.

The new models are the 6-D2, powered by a 125-hp JN-6-BI Cummins, and the 7-D2, powered by a 150-hp JBIS-600 Cummins diesel. The 6-D2 and 7-D2 are similar in design to the 6-D and 7-D which carry General Motors diesels.

The 6-D2 and 7-D2 feature Huber-Warco's combination of a torque converter and full power shift transmission. The power shift transmission permits quick shifts under full load at wide-open throttle without interrupting power flow from the engine to the load.

Also standard on both grader models is a power sliding moldboard, operated hydraulically from the cab. It allows an operator to power-shift the moldboard out of the way as he approaches a culvert or post and then power-shift it back to its former position—all without leaving the cab or slowing his progress.

Complete hydraulic control of every working position is governed from the cab. The blade can be rotated 180° without removing the scarifier teeth.

The entire 6-D and 7-D series, including the new Cummins-powered models, have hydraulic booster steering that retains the positive feel of manual steering. The booster steering reverts automatically to manual operation in case of power or hydraulic failure.

Other features include an all-welded frame with high-arched design; an extra-heavy front axle with the steering knuckle made from a heat-treated steel forging; a heavy-duty final drive with all gears and shafts forged of heat-treated steel; interchangeable hydraulic cylinder components; and on the 7-D series, four-wheel brakes.

In a Hayward, there's no contact between the closing mechanism and the gravel or other materials handled. To be sure—this "no contact" feature is only one advantage. But a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

The Hayward Company, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

Henry Hydraulic Backhoe

Manufacturer: Henry Mfg. Co., Inc., 1700 N. Clay St., Topeka, Kan.

Claims: Henry's new model C-10H hydraulic backhoe now comes equipped with either hydraulic or manually controlled outriggers.

The hydraulic outriggers ease the problem of straight side ditching on slopes up to 25% grade.

A telescopic boom, hydraulically operated, stretches automatically for deep digging and high loading without loss of power. The sliding action of the telescopic boom permits the backhoe to dig

Continued on page 50

TWO LOAD-SPEEDING International® "95"

average 2400 cu. yds. of rock

TWO-TON CHUNKS OF LIMESTONE bang down into the huge Payhauler body—the rugged high-tensile steel sides, triple-section bottom, and super-duty "spring cushions" are built to take rock-shock! And the "95" Payhauler frame is strongest known of any off-highway truck in its class.

WITHOUT LOSING A SWING, 3 cu yd shovel always finds "95" waiting for load. Powerful, fuel-saving 335 hp Turbo-charged diesel engine keeps power high, reduces fuel consumption 10% or more. Maximum engine torque is transmitted efficiently through new cerametallic clutch and shock-saving planetary final drive into greater pay-off work power!

BODY UP... DOWN... IN ONLY 12 SECONDS! Three-stage, double-action hydraulic hoist provides full-time power control. Built-in hydraulic snubber valves assure smooth, over-center dumping action and gentles body return. Proper weight distribution permits safe dumping at edge of fill, yet drive wheels carry ample weight for steep-grade traction.

NO FOOT-BRAKING DOWN-GRADE! Heaploaded "95" Payhauler rolls along safely down to the fill at 10 mph. Hand-operated Torqmatic brake, "terque converter in reverse," is standard equipment, gives accurate, confidence-building control at any speed...on any grade. Earl and Roy Schenewerk, operators of the "95's," say, "Because of Torqmatic brakes, these Payhaulers operate easier, smoother and safer than any other unit we've ever driven. Now, we have no worry on this steep grade."

Payhaulers®

per 10-hour day!

"Best Production I've ever had,"

Says H. D. BROWN
Project Superintendent,
Clarkson Construction Co.,
Kansas City, Mo.

High speed (up to 38 mph.), 16 cu yd capacity, and next-to-automatic operating control of two new International "95" payhaulers are getting Clarkson Construction Co. record-breaking rock production of 2400 cu yds per 10-hour day. Payhaulers are producing this outstanding yardage on the company's 1000-foot cut through dolomite limestone—part of their 7.5 mile, 2-lane highway contract between Bonne Terre, and Halifax, Mo.

The Payhaulers are operating on a 2000-foot cycle which includes a 12% grade. On this grade, too tricky and treacherous for Clarkson's other rock haulers, Payhaulers maneuver speedily and safely downgrade—under positive Torqmatic braking control! Payhaulers' high speed of up to 38 mph also permits the fast average round-trip travel time of only 2 min, 45 sec. That's faster than the 3 cu yd shovel can load one!

H. D. Brown, Project Superintendent, says, "The Payhaulers have got all other rock trucks beat. Control we've had with Payhaulers on this job is something we didn't have on any other truck. We've averaged 150 to 162 loads of 16 to 18 cu yds per 10-hour day. It's the best production I've ever had!"

Other veteran rock men who have used or seen the International "95" Payhauler in action say the same thing. You'll join them, too! Ask your nearby International construction equipment distributor to give you a demonstration.

INTERNATIONAL HARVESTER

INTERNATIONAL® Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Borne Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Got A Tough Digging Job?

• SOFT GROUND

• DEEP WATER

• NARROW SPACE

• STEEP HILLS

Use A Sauerman DragScraper

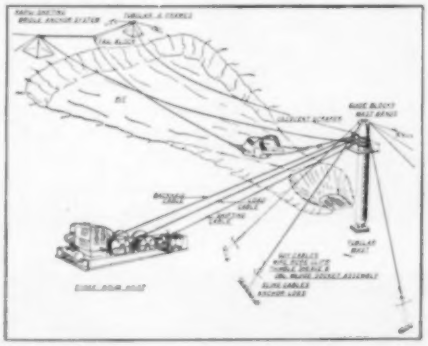
● **SOFT GROUND**—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

● **NARROW SPACE**—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room . . . unworkable with other equipment . . . are handled efficiently and economically with a DragScraper.

● **DEEP WATER**—A Sauerman DragScraper will dig as much as 100 ft. below water... this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

● **STEEP HILLS**—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.



THE SAUERMAN METHOD—*showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd.*

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Teutline Cableways • Durolite Blocks

New Equipment . . .

Continued from page 47

11 feet and load 8 feet. The boom swings in a 160° arc and will dig from any point within that radius.

A parallel circuit control valve with free oil flow permits digging and dumping in one fast, smooth action. Down pressure can be adjusted with a new-type regulator valve.

The self-anchoring, main frame grips 6½ square feet of ground, giving solid support and permitting 16 linear feet of earth penetration. This main frame is of rectangular steel tubing and castings and electric arc-welded throughout.

Double-acting cylinders are honed to a micro-finish. The large diameter piston rods are chromium plated.

The backhoe is made with replaceable bronze bushings. Large diameter pins are at all pivot points.

The hydraulic system is independent of the hydraulic system of the tractor.

Koehring 3-yd. Excavator

Manufacturer: Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.

Claims: Koehring is producing its Model 1205 excavator, the latest and largest of its line of shovels and cranes. The 1205 is listed in the 3-yd. dipper class and has an established lifting capacity of 95 tons at 75% rating.

The standard shovel attachment combines a 30-ft. boom with 22-ft. dipper sticks and 3-yd. shovel dipper. The basic 60-ft. alloy steel boom for the crane can be extended to a maximum 180-ft. length, plus an additional 30 feet of jib.

The all-welded turntable and carbody of the 1205 includes easily-operated mechanical swing and main clutches that do not overheat. Power-actuated clutches on the main drums are applied by hand lever control. Traction brakes are spring loaded and released by air.

Other features includ-: antifriction

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Helps gloss pages of nation's top magazines

Thiele Kaolin Co., Sandersville, Georgia, supplies kaolin to coat paper for *Life* magazine and for quality papers from mills across the country. To get this kaolin, Thiele is working a 30-acre pit, using 2 draglines, a ¾-yd. shovel, and an 11-ton D Tournapull Rear-Dump.

At one end of the mine, a dragline with 6-cu. yd. bucket strips overburden. As the kaolin is exposed, the dragline digs this material and dumps it in stockpiles according to grade.

It is necessary that the various grades of kaolin be carefully blended to produce the final quality specified by the ultimate users. To accomplish this "mixing", a ¾-yard shovel loads "lean" kaolin into the D Tournapull Rear-Dump, which hauls it to other "rich" stockpiles near a mixing hopper. Here a second dragline mixes and loads the kaolin into the hopper. The material is mixed with water and forced by pressure-pump through a pipeline to the mill.

Averages 42 loads a day

At the time these photos were taken, the ¾-yard shovel was loading Tournapull Rear-Dump with approximately 7½ yards of kaolin in about 2¾ minutes. The average 500′ haul from the "lean" pile to dumping area was deeply-rutted, wet, and slippery. Although some of the ruts were 2′ deep, rig's haul-time averaged only 1½ min. It took Rear-Dump less than a minute to turn, back into position, and dump. Rig completed average 1000′ cycle in 6 min. 20 sec.... hauled 38 heaping loads in 6½ hours. Rig averaged 42 loads per 8-hour day, depending on mill requirements.

Replaced 2 trucks with 1 Rear-Dump

Originally, Thiele used 2 trucks, but replaced them with the one D Tournapull Rear-Dump. According to Supt. Owen E. Robbins, "One-man operation suits me! We like Rear-Dump's ability to get through mud where trucks couldn't go."

Power-transfer differential and power-steer, speed hauling

With Tournapull prime-mover's exclusive power-transfer differential, which automatically applies power to wheel on firmest footing, the heavily-rutted and slippery underfooting is no problem. Positive power-steer adds to Rear-Dump's tractive power, because it lets operator pivot prime-mover from side-to-side to "walk" machine out of tough going.

Increase production . . . cut costs

According to Mr. Robbins, a saving of 75% in fuel, and 50% in lubricating oil was effected when 2 trucks were replaced by one D Tournapull Rear-Dump. Changing from trucks to Tournapulls, Thiele Kaolin reduced operating costs and increased production. Rear-Dump provides uninterrupted service in these mining operations.

Rear-Dump hauls heaped loads over deeply-rutted mine floor. Rig keeps going steadily through soft footing, takes minutes off each cycle...hauls up to 42 loads in one day!

Low rear-entry and wide bowl provide easy target for shovel operator... make for fast swingout of shovel dipper, let operator heap maximum yardage with minimum spillage.

At touch of electric switch, body lifts, swings below and behind rear wheels...prevents material from piling under unit.

Looking for a way to save money?

If you have a hauling problem of any kind, investigate Tournapull Rear-Dumps... available in three sizes: 11, 22, and 35-ton capacities. Send for detailed information.

Tournapull—Trademark Reg. U.S.Pat. Off. DR-1062-M-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

BITES DEEPER DUMPS FASTER

Mighty Ice Tong Principle

Whether you need to rehandle or excavate, you will move MORE IN LESS TIME with a KIESLER CLAM SHELL. Our guarantee (see below) is the result of decades of experimentation and factual impartial testing; using *proven* principles of leverage and power and applying that power and leverage to *both* shells the KIESLER CLAM SHELL has more DIGGING-IN ability than any other bucket manufactured. And this digging ability is not dependent on dead weight (counterweights) nor large amounts of cable, hence longer cable life.

Note, too, how little KIESLER shells have to be opened to dump whole load: no "tailing-off" with a KIESLER. This is CONTROLLED DUMPING!

PROMPT SERVICE AVAILABLE

Factory service on Kiesler Buckets and as an accommodation on other makes, too. Whatever the problem, feel free to call on us.

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

KIESLER Since 1892

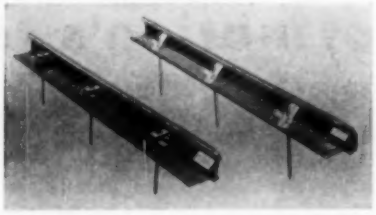
New Equipment . . .

Continued from page 50

bearings on swing and traction clutches and on all constantly rotating shafts; involute splines on all shafts; self-cleaning crawler system; easily-removed and grooved drum lagging.

The Model 1205 is fully convertible from shovel to lift crane and dragline or clamshell operation, handling buckets of 3 to 4-yd. capacity, depending on digging conditions. Total weight of the machine is 179,360 pounds when equipped as a standard shovel and 197,015 pounds equipped as a crane with 60-ft. boom.

Road Forms



Manufacturer: General Road Machines, Inc., Niles, Ohio.

Claims: A new line of general purpose road forms has been introduced by General Road Machines. Available in both single and double wedge lock types, the forms feature special alloy steel electro-welded construction.

The forms have tapered sliding lock joint connections. General carries many popular types and sizes of road forms in stock. It will design and build special forms.

I-R 85-cfm Compressor

Manufacturer: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Claims: Ingersoll-Rand has added a new 85-cfm size to its line of GYRO-FLO compressors. The line now has six sizes of portable compressors ranging from 85 through 900 cfm.

The GYRO-FLO 85 weighs 1,840 pounds ready-to-go, fully equipped with tool boxes, fenders and two-wheel spring-mounted running gear.

The 85 is driven by the Continental Motors F-140 gasoline engine, a 4-cylinder, 4-cycle engine with "L" head design and exclusive individual porting. The F-140 is equipped with push button starting. A heavy-duty 6-volt battery system is used.

The 85 incorporates most of the design features and advantages of the larger sizes.

Galion Rock Body

Manufacturer: Galion Allsteel Body Co., Galion, Ohio.

Claims: Galion is offering a new rock body in 6 to 15-yd. capacities which feature ¼-in. steel plate construction in sides, floor and head. A ¼- in. wear plate over a 2-in. hardwood cushion protects the body floor, while a 4 x 4 x ½-in. reinforced top roll minimizes shovel and loading damage to body sides. For especially severe service, $\frac{5}{16}$ or ⅜-in. body shells and wear plates are available. Horizontal and vertical box braces extending up under the top roll bolster side strength and prevent bulging.

Box-type crossmembers and longitudinals distribute loading and dumping stresses uniformly throughout the body

structure. Longitudinals are extended up under the scow end. A 15° 24-in. scow end eliminates the need for a tailgate. Body sides slope into the floor at a 45° angle. An optional heated floor is available.

A choice of heavily-reinforced half, full or load-carrying cab shields is available.

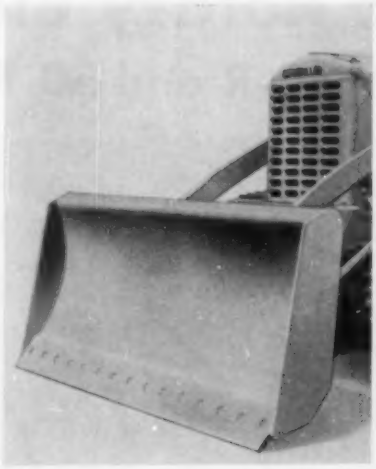
Galion rock bodies are designed for mounting on Models 880 or 1000 underbody and Model 77379 telescopic hoists. Capacities range from 15 to 25 tons.

Traxcavator Bulldozer Blade

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: A 104-in. wide bulldozer blade attachment for the No. 977 Traxcavator has been announced by Caterpillar. The most suitable of two different dozer arrangements now can be chosen for the No. 977 — the new straight bulldozer blade attachment and the previously introduced No. 977A angling blade bulldozer.

The straight blade is useful for leveling, cleanup and backfilling operations usually accomplished with the Traxcavator bucket. Its greater width makes



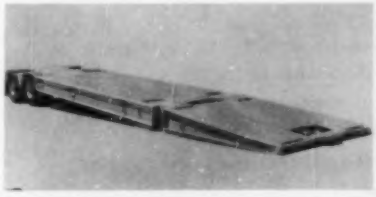
it more efficient than the bucket for these jobs.

The new bulldozer attachment fastens to the lift arms with a bracket arrangement at the same point where the bucket connects. The blade is easily adjusted by operating the standard hydraulic bucket controls.

Folding Gooseneck Trailer

Manufacturer: Martin Machine Co., Kewanee, Ill.

Claims: A front and rear loading folding gooseneck trailer with a level deck has been included as a standard model in the Martin heavy-duty trailer line. Weight is reduced approximately 800 pounds over the drop deck model. Designated as the RFTL series, the new trailer is available in four sizes with capacities of 20, 27, 32 and 40 tons.



With the folding gooseneck lowered, equipment is driven directly on to the platform. The winch-equipped truck tractor lifts the folding gooseneck into towing position. Martin trailers are sold by Caterpillar dealers.

Adams Motor Grader

Manufacturer: LeTourneau-Westinghouse Co., Peoria, Ill.

Claims: The Adams POWER-Flow 660, a torque converter model of its big "660" motor grader, has been added to LeTourneau-Westinghouse's Adams line.

The new unit has basically the same design features as the standard model "660" with the additional operational advantages of a torque converter drive train, plus a 27% increase in engine power.

The POWER-Flow grader teams a 190-hp diesel power plant with a single-stage torque converter and four-range constant mesh transmission. Tripling available torque, this drive system provides the equivalent of an infinite number of gear ratios which adjust automatically to variations in load requirement.

An exclusive feature is a mechanism which allows the operator to make changes in travel from forward to reverse, and vice versa, without hand shifting. It is accomplished with a rocker-type pedal located on the cab floor where the clutch pedal would be in a standard transmission machine. To set the grader in forward motion in any previously selected range, the operator has only to press the rocker pedal with his toe. To shift to reverse he rocks his foot on the pedal, applying pressure with his heel. Change of direction is immediate.

Another item to help the operator is a tail shaft governor which automati-

Continued on page 56

There's Something

BIG

Coming From

BUCYRUS ERIE

NEXT MONTH!

196E56-e

Bucyrus-Erie Rotary Blast Hole Drills

40-R and 50-R give New Meaning

IN COPPER MINES — Putting down 9-in. holes in a large mine in western United States, this 40-R achieved an average penetration of 69 feet per actual drilling hour. Average depth of holes was 29 feet.

On a variety of jobs everywhere, Bucyrus-Erie 40-R and 50-R rotary blast hole drills are setting new footage records. Among these is the 1,325 feet 10⅝-in. dia. hole put down in a single 6¾-hour shift by a 50-R working at a large Indiana open pit coal mine. This outstanding achievement is due, in part, to such cost-cutting features as Ward Leonard electric control on rotation of the drill stem, and hydraulically-powered down pressure on the bit.

Many other features, however, contribute to the speedy, efficient operation of Bucyrus-Erie rotaries. Let us explain them to you and show you how these rigs can cut YOUR drilling costs. Write today for detailed, illustrated literature. Two models are available — the electric or diesel-electric 40-R for drilling 6¾- to 9-in. holes and the electric 50-R for drilling 9⅞- to 12¼-in. holes

39856C

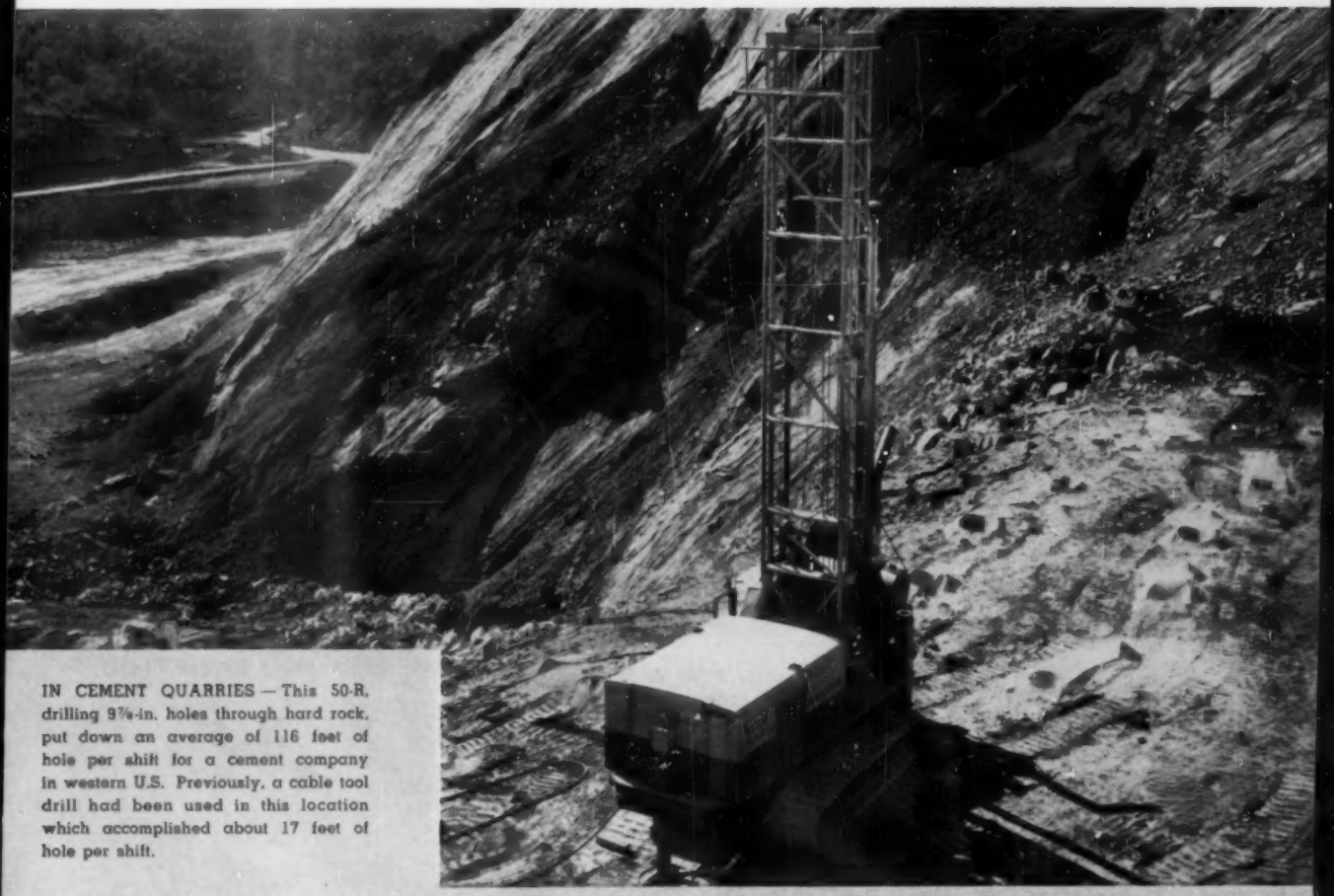
IN ROCK QUARRIES — Equipped with 9-in. bits, this 40-R averaged 17.2 feet per drilling hour through hard dolomite at a quarry in eastern United States. Before the 40-R was brought to the job, cable tool drills were used which averaged 4½ feet of hole per hour.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

Shatter Old Footage Records

To Large-Diameter Drilling

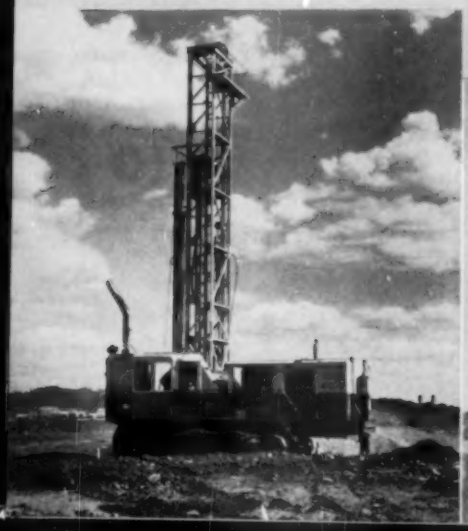


IN CEMENT QUARRIES — This 50-R, drilling 9⅞-in. holes through hard rock, put down an average of 116 feet of hole per shift for a cement company in western U.S. Previously, a cable tool drill had been used in this location which accomplished about 17 feet of hole per shift.

ON THE ST. LAWRENCE SEAWAY — On a section of the Seaway near Montreal, Canada, this 40-R drilled 6¾-in. holes through shale and igneous rocks to depths averaging between 39 and 40 feet. Average penetration was 53.7 feet per hour of drilling.

IN IRON MINES — Some of the toughest rock drilled by a 50-R consisted of iron ore, white waste rock, and a formation resembling Oriskany sandstone, reported to be harder than pink quartzite. On this assignment the 50-R shown here rolled up a footage record of 166 feet of 9⅞-in. hole per shift. This was over three times the amount put down by a cable tool drill before the 50-R was introduced to the job.

IN COAL MINES — At a large Ohio open pit mine, this 50-R drilling 10⅝-in. holes through overburden consisting of approximately 35% clay, 25% sandstone, 35% shale, and 5% limestone with occasional fireclay over the coal seam, averaged about 106 feet per drilling hour.



MIGHTY MONSTER on the Mississippi

Photo Courtesy of Dravo Corporation, Pittsburgh, Pa.

Standing beside the giant Owen Clamshell is Mr. George S. Covert, Director, Louisiana State Highways

Building the new $65 million Mississippi River Bridge requires the varied skills and services of many contractors, construction men and a vast array of construction equipment.

The noteworthy first phase of this tremendous undertaking was the construction of the four huge piers by DRAVO CORPORATION, PITTSBURGH, PA.

The largest pier will be as high as a 34 story building, with more than half of it under water.

OWEN BUCKETS

were used in sinking caissons for the giant pier foundations

It's difficult to find any big construction project where OWEN buckets are not at work on important digging and material handling operations.

OWEN buckets are built to withstand rugged usage for long periods of time with a minimum of service.

Write for CATALOGS

New Equipment . . .

Continued from page 53

cally adjusts engine speed. The torque converter constant mesh transmission combination of the POWER-Flow 660 provides four forward speed ranges from a creeping .23 mph to 27.4 mph. The instant reverse provides an equal number of ranges from .22 mph up to 24.4 mph.

Engine options for the new grader are either the Cummins HRFB1 600 or the General Motors 6-71, both rated at 190 hp. The torque converter design uses components manufactured by Le-Tourneau-Westinghouse. The constant mesh transmission is designed and built by the Adams Div., employing many units and parts interchangeable with the standard transmission "660" model grader.

Replaceable Digger Teeth

Manufacturer: Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio.

Claims: Allied has announced its newly designed Bulldog replaceable digger teeth for shovel dippers, back hoe dippers, dragline buckets, clamshell buckets and loader buckets.

A Bulldog replaceable digger tooth has three parts: 1) a universal weld-on adapter that is easily attached by using the old tooth as a base; 2) a replaceable tip; and 3) two positive lock pins for securing the tips to the adapter.

The teeth are attached in three steps: 1) burning off the old tooth to the adapter size; 2) welding on the adapter; and, 3) securing the replaceable tip to the adapter by tapping the pins in place with a hammer.

Adapters are made in 15 different widths from 2¼ to 7 inches.

Fast D Tournapull, owned by Texas Lightweight Aggregate Co., gathers speed leaving processing plant for 1-mi. trip to loading area. This one "D" — plus crawler-mounted front-end loader, and a tandem-disc plow — replaced a fleet of 4 tractors and 2 towed scrapers.

At Haydite plant, one "D" replaces hauling fleet

moves same quantity in 1/3 less time!

Haydite is the tradename for lightweight expanded clay and shale aggregate, manufactured by Texas Lightweight Aggregate Company at the Stafford, Texas plant a few miles southwest of Houston. Black clay is broken up into marble-sized chunks, heat-expanded in rotary kilns, then cooled. The rock-hard finished aggregate is sold to ready-mix plants and manufacturers of concrete products for lightweight concrete and masonry units.

To keep its Rotary Kiln Haydite aggregate plant in Stafford, Texas, supplied with black clay, Texas Lightweight Aggregate Company, a division of Texas Industries, Inc., relies on one D Tournapull and a crawler-mounted front-end loader with tandem-disc plow. The "D" — working 16 hrs. daily — replaces 4 slow-speed tractors and 2 towed scrapers that worked around the clock to supply plant at the same rate.

The clay used is plastic, and very dense . . . hard as a rock when dry . . . soft and slippery when wet. The trick is to excavate it with just the *right* moisture balance — then haul direct to kilns or stockpile it in a sheltered area for future use. Condition of clay deposits at any given time depends on the weather of many preceding days and must be disced properly to maintain proper moisture for special loading.

Hauls over 2 to 4-mi. cycles

Sometimes, when stockpiles run low, a large amount of clay must be moved in a few hours to supply the kilns. Strip-mine areas are about a mile from the processing plant. Because good-sized yardages have to be loaded and moved fast, Texas Lightweight Aggregate finds Tournapull just the right machine. Working alone, "D" handles a job that previously required many machines.

Single Tournapull supplies materials

Total excavation, loading, pit-to-stockpile hauling, and dumping on shed, is handled by this single Tournapull. Rig self-loads as much as 6½ loose yds. per trip . . . hauls up to 1 mi. to stockpile sheds at speeds to 29.5 mph.

Spreads in tight quarters

Dumping at the plant involves careful maneuvering. The stockpile is next to the kilns, under a large shed. Turning space is restricted. The "D" frequently has to climb up and dump over previous stockpiles, with limited overhead clearance. 90° turn, electric power-steer through geared king-pin lets this LeTourneau-Westinghouse earthmover maneuver easily into the shed . . . spread . . . and swing out for another load in seconds.

"They turn fast and they're maneuverable," commented Richard Messer, Stafford Plant Superintendent. "They get out quick and back quick — both on the pick-up and spread, that differential helps us work good in mud during wet weather."

Get facts for your type work

If your earthmoving operations require steady production, plus hauling over a considerable distance, it will pay you to investigate the advantages of the 9-yd. D Tournapull, or the larger 18-yd. "C" or 25-yd. "B" sizes. Let us show you owner-verified facts on Tournapull production for *your* type of work.

"D" turns as it dumps on clay stockpile. In another 10 seconds, rig will be returning at high speed to loading area.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-1051-M-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

How Bucyrus-Erie

Not far from Portland, Maine, a 22-B Transit Crane handles concrete bucket during construction of the Maine Turnpike extension.

Smallest convertible excavator in the Bucyrus-Erie line is the ⅜-yd. 10-B, shown here cutting a road through a hill to a dam site near Barre, Vt.

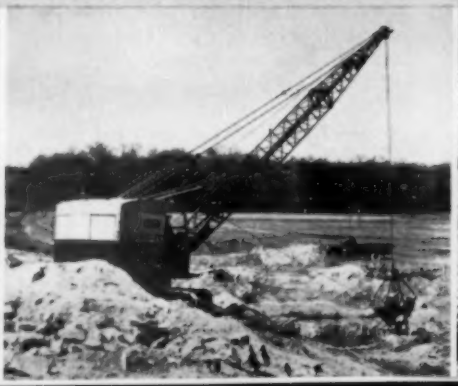
Bucyrus-Eries are a familiar sight on turnpike projects. This 2-yd. 51-B is cutting down high ground for the Garden State Parkway in New Jersey.

Bonus Quality *saves you money*

For chemical analysis of steel and other materials, Bucyrus-Erie's laboratory has the finest scientific equipment, including the spectrophotometer shown here. This apparatus analyzes the elements in steel by measuring the degree to which a steel solution absorbs certain waves of light. The exact amount of each element present can be determined by this extremely sensitive instrument.

This 15-B ½-yd. dragshovel excavates for a street widening project in Shawano, Wis.

Equipped with a clamshell bucket this ¾-yd. 22-B moves dirt at the site of a new highway bridge at College Park, Md.



In the wilderness of Washington's Olympic National Park, a 1½-yd. 38-B shovel works on an access road.

Quality Control

Helps You Earn More Dollars

From the time molten metal is ready for pouring castings until the day a machine is shipped, Bucyrus-Erie's laboratory keeps a vigilant watch over the manufacturing process. The laboratory, rivaling those of companies specializing in metal production, won't let any part through until it passes all specified tests. Let's take a look at what happens to steel:

Each lot of steel undergoes standard metallurgical tests to ascertain if our rigid specifications have been met and where conditions warrant it photo-micrographs are made to permit a study of the grain structure. After steels have been subjected to various heat-treating processes, they are selectively tested for tensile strength, yield point, compression resistance, hardness, and ductibility. A quench-testing machine assists in determining the hardenability of various steels. Only after they meet ALL specifications are they allowed to go into Bucyrus-Erie machines.

Such close attention to details pays off for you on the job through more efficient operation . . . longer life. For the full story on these profit-builders, write, see, or call your nearby Bucyrus-Erie distributor. He will be glad to help you select the right Bucyrus-Erie for your work.

213E56C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

This 4-yd. 88-B excavates rock in turnpike construction near Blanford, Mass.

On the Kentucky Turnpike, a 54-B dragline with 60-ft. boom and 3-yd. bucket loads dirt into bottom-dump trailer.

On the Indiana Turnpike this 3-yd. 71-B dragline clears away sand and peat near East Gary.

NOT in the Contract

A bad outbreak of horse and cattle rustling and stock stealing in general was taking place in the Ozarks. The communities were alerted and young men deputized to add to the normal police force. No sooner was all this organized than the national prize-winning hog was stolen.

As the thieves drove up to a road block, they put a hat and coat on the stolen hog in the car. Two men deputy sheriffs looked in the car, pointed to the driver and inquired, "What's your name?"

"Jack Haley," said the driver.

"What's yours?" the deputy asked the second man.

"I'm Jim Haley, Jack's brother."

Pointing to the hog, the deputy demanded, "And what's yours?"

"Oink," said the hog.

So the deputies searched the car and truck, found nothing, and waved the driver on.

In a few seconds, one of the deputies burst out laughing.

"What's so funny?" asked the other.

"Ain't that Oink Haley a homely son-of-a-gun?"

"Why did you fire that gorgeous secretary you had?"

"She couldn't spell—kept asking me how to spell every other word when she was taking dictation."

"And you couldn't stand the interruptions?"

"No, it wasn't that. I just didn't have time to look up all those words."

Then there was the geologist who had a hobby of collecting stones and putting them in his bathroom. He had rocks in his head.

A student at a California college had been pestering his father for a '56 model auto. On a visit to the campus the father pointed out that most of the cars in the parking lot were of ancient vintage. "But, Dad," protested the boy, "those cars belong to the faculty."

Stranger: "I came in because I read your ad for a man to retail canaries."

Proprietor: "Oh, do you want the job?"

Stranger: "No, but I'm curious—how did the canaries lose their tails?"

Stopping at the first house on his famous ride, Paul Revere cried, "Is your husband home?"

"Yes," came the answer.

"Then tell him to dress and come to help fight the British."

At the second, third and fourth houses, he repeated the conversation. As he rode by the fifth house, he again repeated the cry.

"No," was the reply.

"Whoa."

Classified ad: "Lost or strayed—tan leather wallet . . . contained pictures, personal papers and $350 currency. Finder may keep pictures, personal papers and wallet, but I have a sentimental attachment to the money."

Hillbilly to neighbor: "They tell me your wife makes moonshine whiskey."

Neighbor: "Yes, and I'm ashamed of her, but with all her faults I love her still."

The small boy had just asked his father: "Where did I come from Daddy?" The boy seemed to listen attentively and at the end of the explanation his father asked him, "What made you ask, Son?"

The boy was playing with an airplane model and replied casually: "Oh nothing 'specially, Dad, 'cept I heard the new boy at school say he came from Baltimore and I wondered where I came from."

An East Texas farmer brought a load of produce to Dallas and during the day sold it at a good price. He then decided to surprise his wife who was always scolding him for wearing such old, worn clothes. He bought a complete new outfit, stowed the package under the seat of his car, and took time out for a few beers.

Halfway home that night he stopped on a bridge, pulled off all his old clothes and threw them over the railing into the river, and reached under the seat for the new ones. They were not there; some thief had taken them during the farmer's beer interlude. Thoughtfully he climbed back into the car and stepped on the starter. "Oh, well," he mused, "I'll surprise her anyway."

Here's how it all started: A Russian named Rudolph looked out the window one morning and said, "It's raining."

"No, it's sleeting," said his wife.

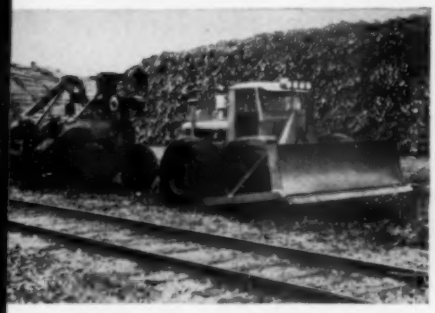
"It's raining, doggone it," he answered, "and Rudolph, the Red, knows rain, dear."

". . . and all the time we've been blaming the restaurant for this coffee tasting so bitter."

Speed and Mobility

get more work done!

Tournatractor takes the shortest route to job . . . via highway or cross country . . . cuts hours from job-to-job moves.



208 hp Tournatractor with PCU on rear can be hooked up to pull scrapers, rooters, and rollers.

Rubber tires do not damage rails or ties... unit can switch up to 10 fully-loaded railroad cars at once.

Whenever your application involves scattered job assignments, Tournatractor's 17 mph forward speed and extreme maneuverability cuts moving costs and reduces the non-pay hours of moving time. Big, low-pressure tires let you drive Tournatractor anywhere. For long moves, you save time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Speed on the job

Tournatractor pulls, dozes, pushes at working speeds 2 to 3 times faster than crawler tractors. You have 3.69 mph in second gear, 8.38 mph in third, compared to crawler speeds of around 2 mph in second, and 3 mph in third. Tournatractor travel speed of 17 mph compares to the crawlers' top ranges of 4 to 6 mph. You change gears instantly . . . waste no time shifting.

8 mph reverse speed

High reverse speeds give a very important time-saving advantage to tractor-on-rubber. Nearly 50% of your working cycle on dozing or pushing jobs is usually spent backing up. Tournatractor's reverse speed cuts crawler backing up time by almost 25 to 50%. Crawler highs in reverse range from 3.1 to 6.2 mph. Tournatractor high in reverse is 8 mph.

Instant shifting

Constant-mesh transmission aids high-speed performance by eliminating delays in changing gears . . . saving vital momentum . . . gives you any gear ratio instantly. Tournatractor works in higher gear ratios because there is no loss of momentum for shifting. Torque converter increases this advantage by giving you wide automatic over-lapping of gear ratios, without depending on operator to jockey levers to get the most effective ratio of power and speed to load.

Ample flotation and traction

2' wide tires stay on top of soft ground instead of digging in. Lugs bite into underfooting to give traction. Tire pressures as low as 20 lbs. absorb shock. Rolling action compacts loose materials far more effectively than crawlers.

Lower maintenance

There are 4 easy-rolling-wheel-assemblies as compared to more than 500 wearing parts in standard track-assemblies. This means less maintenance. Dollar-wise this reduction in maintenance time can mean a saving of $3 per hour in operating expenses.

Easier to operate

Fingertip electric controls work at the flick of a switch. Steering, raising and lowering the blade, and operating the power-control-unit are all handled by buttons on dashboard. There are no levers, wheels, or other manual controls to handle. Big, low-pressure tires greatly reduce jars and jolts, stress and strain, on both operator and machine.

Interchangeable equipment

Adding to Tournatractor's versatility are a number of interchangeable attachments . . . Bulldozer, Angledozer, Root Rake, Snow Plow. This versatile tractor can also be equipped with a Push-Block, Logging-Winch or Tree-Pusher for additional applications. Drawbar and PCU are available for hauled equipment. Electric-control, open-top scrapers are also available for use with Tournatractors.

Find out for yourself how Tournatractor's go-anywhere mobility and 17 mph speeds can help you get more work done. Compare this rubber-tired tractor alongside your present crawlers. Write or call for a demonstration.

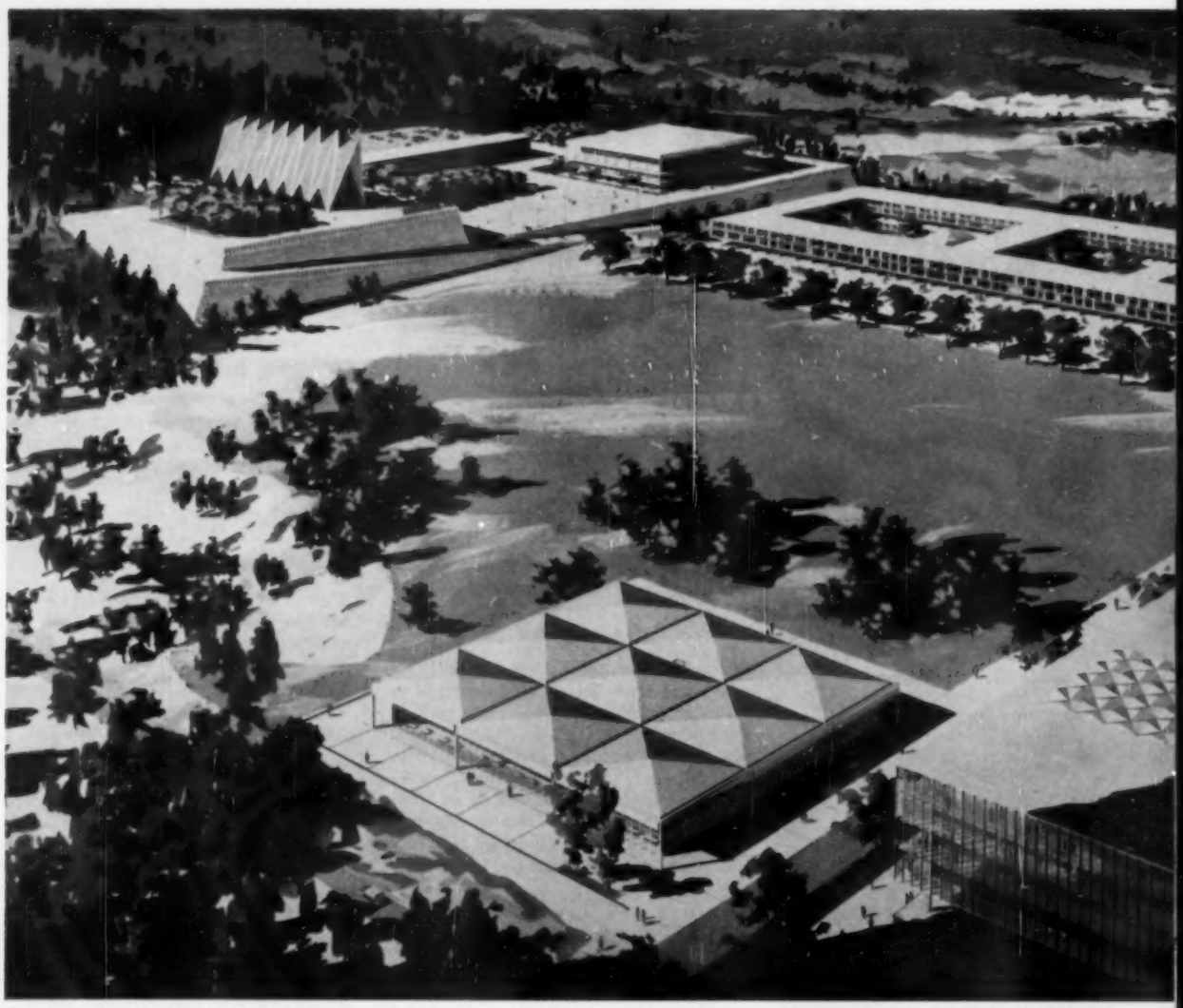
Tournatractor—Trademark Reg. U.S. Pat. Off. T-926-G-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Clockwise from peaked chapel at left are administration, social center, cadet living quarters, academic and dining hall buildings.

Academy . . .

Continued from page 21

sprinkled to its optimum moisture content of about 9% as it goes in. Specifications call for a 95% Modified Proctor density up to the spring line, and 90% from that point up to the top of the pipe. This density requirement is carefully controlled by frequent laboratory tests.

When the final chapters are written, and the magnificent buildings of the new Academy stand beautifully outlined against the Rockies, people may tend to forget the excellence of this little subcontract by Hardeman Construction Co. But the heavy concrete pipe, most of it double strength for hundreds of years of service, will lie deep underground carrying rains and storm water away from the academic and stadium areas, which will receive much more attention from the public.

Built to a master plan, the Air Force Academy will occupy a tract approximately 17,500 acres in size. The site is only slightly north of Colorado Springs, and is characterized by a sharply rising topography of mesa formations. This varied character has allowed the architects to locate groups of structures in the interior of the tract which command spectacular views within the site and beyond.

Level Land Available

The airfield area location on the southeast corner of the site has been based upon availability of reasonably level terrain, both for the actual runway paving and for safe approach zones as oriented by prevailing winds. Immediately to the west is located the supply and base services area, which is semi-industrial in character. The supply and services area performs housekeeping functions.

The cadet academic area and related activities occupy the northwest corner of the site close to the everlasting Rockies. The location of this key segment of the Academy has been studied to accommodate a very demanding curriculum, and the sites selected have been influenced by the need for cadet housing, academic, athletic and administrative components being within reasonable walking distance of each other.

The general elements of the plan include the academic area, athletic fields and the maneuver area. The academic area complex is set on the mesa south of Upper Lehman Valley overlooking the valleys to the north and south, the Great Plain to the east, and rising on the foothills with the Rampart Range as an ef-

fective, spectacular backdrop. To the north, in Upper Lehman Valley, will lie extensive athletic fields occupying the broad valley floor where these facilities can be adequately accommodated. The beautiful valley to the south provides an interesting site for a proposed Academy golf course, which will probably be built with non-appropriated funds.

Housing will be situated south of this valley in varying terrain. Family housing for officers and support personnel will be located in Douglas Valley and Pine Valley. Support personnel housing for single airmen will be located on the high mesa between the two valleys, sharing this location with the community center. The bachelor officer and visiting officer quarters are to be located next to the Academy staff club on a promontory overlooking the valley to the north. The superintendent's residence will be located beside the cadet area on a hill to the east overlooking the parade ground.

The community center will stand on the mesa between Douglas and Pine valleys in the center of the neighborhoods, yet will be separated from them by marked terrain features. The community center will provide shopping, recreational and religious facilities.

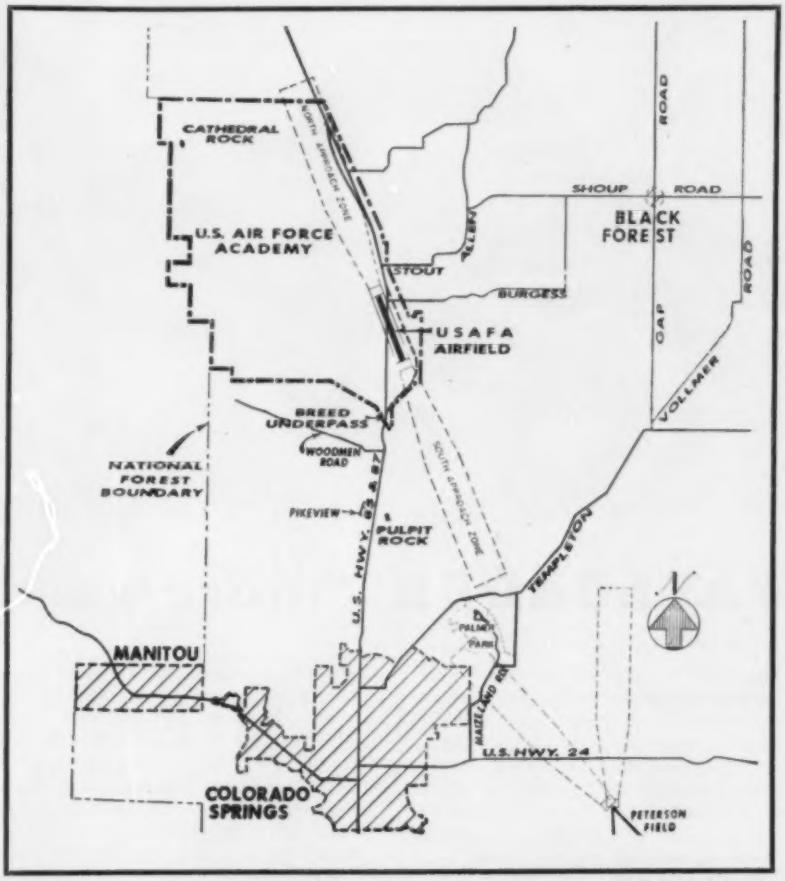
Spectacular Views

Public-use structures have in the main been concentrated in locations which flank the public access. Thus, the proposed site for the future athletic stadium and accessory parking facilities is planned in close proximity to the north entrance from U. S. Highway 85-87. This will eliminate public traffic generated by athletic events in the stadium from internal roads in the Academy tract. A 15-mile road above the general area at the base of the foothills also will permit visitors to drive above the Academy site, commanding a spectacular view of the installation without actually having to use service roads in the Academy area.

While the permanent Academy is being built, future air commanders are being trained at an interim academy at Lowry Air Force Base at Denver. Lowry was selected because of its nearness to the permanent site, and because almost all of the buildings required were in existence. The first class of 300 Air Force cadets began their training in July, 1955. Lieutenant-General Hubert R. Harmon was the first superintendent. Major-General James E. Briggs is the present commandant. When the Academy is completed and all four classes take up residence, approximately 2,640 future air officers will be in training there in the fundamentals of USAF officership. Final air training will be given at other Air Force fields.

All construction operations are under control of the Air Force Academy Construction Agency, which was created June 4, 1954. Its assigned mission is "to direct the planning, designing and construction of an Air Force academy and simultaneously to assist in the provision of facilities for the interim acad-

Continued on page 66



Map shows location of the Academy on 17,500-acre tract north of Colorado Springs. Cadet academic area is in the northwest corner of site and airfield in southeast.

How many yards per hour?

PAYLOADER® "more yardage" features

Balanced four-wheel-drive, torque-converter and exclusive power-transfer differentials give more effective traction on mud, gravel, ice and snow for more reliable crowding power. Coupled with this crowding power is the unusual pry-out action and 40° tip-back of the bucket at ground level to get full bucket loads with less spillage loss. The result is that a "PAYLOADER" can

dig more

The 40° tip-back of the bucket at ground level permits a carry position that is close and low for maximum stability and with bucket opening almost level to prevent spillage of heaped loads. Hydraulic system shock absorber cushions the loaded bucket while carrying, smooths the ride and allows higher carrying speeds with less spillage. These features enable a "PAYLOADER" to

carry more

It's the yards delivered that count on any job and that's where a "PAYLOADER" really pays off. It gets more load in the bucket with less spillage to begin with — it can carry at higher speeds with less spillage — it can maneuver faster because the power-shift transmission requires no stopping for ANY shift. All these advantages enable "PAYLOADER" tractor-shovels to

deliver more

More yards on any job!

No one knows better than you that a rubber tired tractor-shovel can do so many jobs, under so many kinds of job conditions, that the yardage handled can vary considerably. That's why yardage figures can be so misleading unless all the factors are taken into consideration . . . kind of material . . . whether in-place or rehandling . . . operator efficiency . . . length of haul . . . waiting time for trucks . . . one location or scattered jobs, and many other variables that affect daily output.

But of this you can be certain . . . on any given job the new "PAYLOADER" tractor-shovels will deliver more yards per day than any comparable size tractor-shovel . . . and will do so continuously shift after shift.

The knowledge and experience gained in building thousands of tractor-shovels over the past 30 years is your assurance that a "PAYLOADER" is superior in design, engineering and performance . . . that it will outperform and outproduce any other comparable unit on any job.

So don't be deceived by "box-car" yardage figures . . . take a close look at the "PAYLOADER" . . . on *your* job . . . and you be the judge. Your "PAYLOADER" distributor will be happy to arrange a demonstration at your convenience.

THE FRANK G. HOUGH CO.
708 Sunnyside Ave., Libertyville, Ill.

Send data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked

- ☐ HO (2¼ yd. payload, 1¾ yd. struck)
- ☐ HH (1¾ yd. payload, 1-1/3 yd. struck)
- ☐ HU (1-1/3 yd. payload, 1 yd. struck)

Name_____
Title_____
Company_____
Street_____
City_____
State_____ 7

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Academy . . .

Continued from page 63

emy." Heading this agency as director is Colonel Albert E. Stoltz, with John P. Huebsch as deputy director.

The firm of Skidmore, Owings and Merrill, Chicago, Ill., was appointed architect-engineer for the huge building project in August, 1954. The firm has responsibility for over-all coordination and administration of design, including master and site planning, and all architectural and engineering services through construction supervision. It has its offices in the same building as the Construction Agency at 3333 North El Paso St., Colorado Springs. Carroll L. Tyler is general manager of the project for Skidmore, Owings and Merrill.

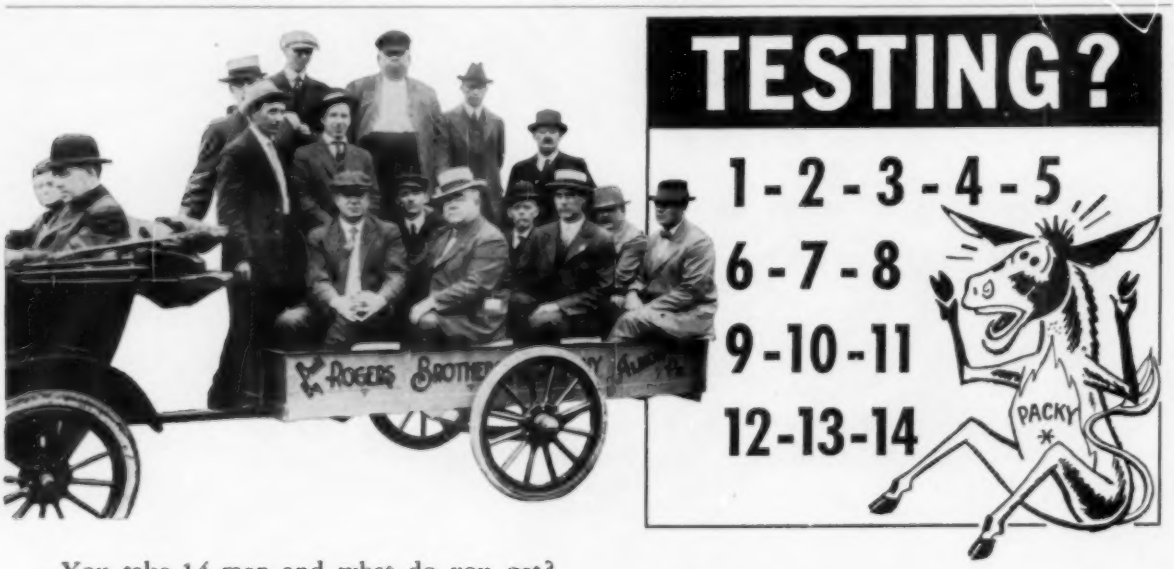
Associated with the architect-engineering firm are Robert & Company Associates of Atlanta, Ga.; Moran, Proctor, Muser & Rutledge of New York, N. Y.; and Syska & Hennessy, also of New York. These firms are advising on utilities, airstrip design, and electrical and mechanical work respectively.

Main Job Ahead

In general, 1956 should see completion of the first increment of utilities, completion of the main grading for site preparation in the academic area, and construction of foundations for academic buildings and cadet quarters. In 1957, it is expected that the main utilities will be finished, along with many of the support buildings. The year 1958 is slated for the first occupancy of the new Academy by a class of cadets, and in that year practically all the buildings will be finished, along with final utilities such as an incinerator, heating plant, the last service roads, and final landscaping. Final completion of the chapel, hospital, nurses quarters and cemetery is slated for 1959.

In a recent talk, General Harmon gave his concept of what cadets in the new Academy must assume in the way of responsibility to their country.

"Today they are being schooled in the science of airmanship and the nature of our world," he said. "Tomorrow they will go forth as responsible officers in the world's most effective instrument for peace. The specialized training and education they are receiving at the Air Force Academy will earn for them respected positions in the continuing development of our national well-being. Their stature in our national structure will increase as our knowledge broadens concerning the limitless sky surrounding our planet."



You take 14 men and what do you get?

In 1914 when this first Rogers commercial trailer was built, 14 men constituted an appropriate load test.

42 years later it is still an "iron bound" Rogers policy to load test their vastly improved current models under actual hauling conditions.

You'll find a liberal safety factor in every Rogers Low-Bed Heavy Duty Trailer today.

*Introducing "PACKY" the pack mule, the traditional load carrier in the old "four legged" field. He is a natural kibitzer and sometimes envious commentator. We'll have to contend with him for a while at least, unless he lets his mulish traits get the better of him.

Experience Builds 'em ROGERS Performance Sells 'em

ROGERS LOW BED — HEAVY DUTY TRAILERS

ROGERS BROS. CORP. ALBION, PENNA.

Export Office: 50 CHURCH ST., NEW YORK 7, N.Y., U.S.A. *Cable Address:* Brosites

Road Show . . .

Continued from page 25

years, the total here will be $39 billion.

Summing up, $27.5 billion will be spent for the interstate system; $22 billion for other federal-aid roads; and $39 billion by local governments. The grand total is an unparalleled $88.5 billion market for the roadbuilding industry during the next 13 years.

New highway construction which ran about $4.6 billion in fiscal 1956 is expected to climb possibly to $5.7 billion in fiscal 1957, $7 billion in 1958, and $8 billion in 1959, according to ARBA estimates. The industry's yearly volume of business will nearly double within the next three years.

A report prepared by ARBA's Task Force on equipment found that at least 57,000 new pieces of construction equipment will be needed for each $1 billion worth of construction above the $5.8 billion level (see table below). About 22,000 of these units would be trucks; 3,000 power cranes and shovels; and 13,000 tractors, scrapers and motor graders of all types.

"Task Force" is a designation applied to each of four committees commissioned by the ARBA to prepare reports on the ability and readiness of the engineering profession and the highway industry to plan, design and execute a long range program to eliminate deficiencies in United States highways.

Road Show Well-Timed

With the expectation of pocketing more and larger contracts in the months ahead, roadbuilders will be looking for new equipment—larger units and more efficient machines that will cut costs and improve their competitive position. The timing of the Road Show could hardly be more perfect to meet this high interest in equipment and methods.

Information about the Road Show and hotel reservations for the ARBA convention may be obtained by writing to American Road Builders' Assn., World Center Bldg., Washington 6, D. C.

Two other organizations will meet in Chicago January 28—February 2. The Associated Equipment Distributors, representing construction machinery dealers, and the International Road Federation are also holding conventions at the same time as the ARBA to enable their delegates to view the Road Show.

Equipment Available for Highway Contract Construction as of January 1, 1956

Description	Number of Units	Additional Units Required for Each $1.0 Billion New Construction*
Construction Machinery and Allied Equipment		
Tractors, Crawler†	33,000	4,500
Tractors, 2 and 4-Wheel (contractors type)	9,300	3,000
Scrapers, Hauling (all types)	17,200	3,200
Off-highway Hauling Equipment (end, side and bottom dumps)	11,200	1,800
Power Cranes & Shovels	16,500	3,000
Motor Graders	15,100	2,500
Rollers (all types)	13,000	2,500
Loaders, Front End, Wheel	6,500	1,600
Ditchers & Trenchers	1,210	250
Hydraulic Hoists & Dump Bodies††	(70,000)	(16,000)
Air Compressors, Portable	13,750	2,250
Batching Plants, Concrete	4,000	300
Concrete Mixers, Portable	5,200	1,200
Contractor Pumps	41,500	2,340
Concrete Pavers	1,125	150
Concrete Spreaders	1,525	175
Concrete Finishers	1,525	175
Truck Mixers & Agitators	7,300	1,500
Asphalt Plants, Portable	2,000	200
Bituminous Pavers (spreaders-finishers)	3,040	300
Bituminous Distributors, Truck Mounted	6,500	250
Crushing & Screening Plants, Portable	2,300	250
Miscellaneous Units (10%)	20,928	3,144
Subtotal	233,703	34,584
Motor Vehicles		
Pickups & Autos	11,825	2,600
Trucks, 1½-3 Tons	42,350	9,600
Trucks, over 3 Tons	38,720	8,500
Trucks, Miscellaneous	4,050	1,800
Subtotal	96,945	22,500
Grand Total	330,648	57,084

*For annual highway work volumes in excess of $5.8 billion.
†Including attachments and power control units.
††Not in total, included as integral parts of trucks and off-highway hauling equipment.

Ford Plant . . .

Continued from page 27

down to ⅜ inch, are being installed in the superstructure.

Excavation depth for the pipeline work ranges from about four to 10 feet, with 50% of the excavation in rock.

Wrenn-Singleton-Gallagher's equipment includes a 22-B dragshovel; a Cleveland ditcher; and a Case front-end loader; a Fordson tractor for hauling; and a 500-cfm compressor.

Complete warehousing and fabricating facilities are mantained. The 120 x 60-ft. warehouse area contains steel pipe, 24 inches through ⅜ inch; galvanized steel pipe, 10 inches through ½ inch; waste piping, 12 inches through 2 inches; and rubber pipe, 5 and 10-inch.

Fabricating equipment includes Oster, Toledo and Beaver machines for threading from 8 inches down; 200 to 300-amp P & H, Lincoln and Westinghouse welders; and a 12-in. Kalamazoo metal cutting band saw. The pipe is handled in the yard by a Lorain Moto-Crane.

Wrenn's installation job, which was nearly completed in April, included: 6,000 lineal feet of 30-in. through 15-in. concrete pipe; 9,000 feet of 30-in. through 6-in. clay pipe; 6,000 feet of 4 to 12-in. cast iron soil pipe; 15,000 feet of 30-in. and under mechanical joint water main; and 6,000 feet of steel pipe for gas and drains.

A. Earle Wrenn, president of Wrenn Bros., Inc., is general superintendent on the superstructure work. W. J. Harvard is assistant general superintendent. B. L. Ticktin is project manager and Amos Leach is chief engineer.

George Sweeney is Ford's resident engineer.

New Trade Literature

Subject: **International Harvester Bulletins**

Content: International has printed two new folders. Booklet CR-495-F, a six-page, two-color folder, completely describes the 24-ton model 95 and the 18-ton Model 65 Payhaulers—first in International's line of off-highway hauling vehicles. Close-up photographs and drawings illustrate components of the units. Booklet CR-521-F is concerned with the new 2¼-yd. Drott TD-14 four-in-one skid-shovel. Job-site photographs illustrate the adaptability of the unit, in its quick change from skid-shovel to clamshell to bullclam to bulldozer.

Where to get: Construction Equipment Div., International Harvester Co., 180 N. Michigan Ave., Chicago, 1, Ill.

Subject: **Alloy Steel Tractor Parts**

Content: A new six-page, two-color pamphlet on manganese steel tractor replacement parts has been prepared by the AMSCO Div. of the American Brake Shoe Co. The folder illustrates and points out the advantages of manganese steel in track shoes, scraper blades, end bits, sprocket and idler rims and grouser bars. It suggests the economical use of these replacement parts of tractors in quarries, mines and slag moving operations. A section is included on the proper procedure for welding on replacement manganese steel sprocket or idler rims.

Where to get: AMSCO, Dept. 5, Chicago Heights, Ill.

Subject: **Detroit Diesel Sets**

Content: A new brochure outlining its complete line of electric generator sets has been issued by Detroit Diesel. The brochure includes specifications and illustrations of more than 25 radiator and heat exchanger-cooled models ranging from 20 to 245 kw. Both 50 and 60-cycle and direct current units for emergency standby and continuous off-the-line use are represented. Features of the two-cycle Detroit Diesel engines which operate the sets, and automatic starting and shutdown equipment are fully covered.

Where to get: Detroit Diesel Engine Div., 13400 W. Outer Dr., Detroit 28, Mich., or from Detroit Diesel distributors and dealers.

Subject: **A-C Torque Converter**

Content: Allis-Chalmers has issued a new hydraulic torque converter folder covering current models of its crawler tractors. Ask for folder MS-1140.

Where to get: Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis.

Subject: **Wire Rope Assemblies**

Content: Macwhyte has issued a catalog of many swaged wire rope assemblies. These assemblies consist of a length of preformed wire rope with a terminal attached to one or both ends. Each end can be a different terminal fitting such as a threaded stud, oval eye, pin eye, clevis, hook, fork or turnbuckle, among other things. The 24-page catalog gives all the dimensions, drawings, capacities, sizes of both terminals and wire rope. Catalog No. 5601 is titled *Industrial Standards Macwhyte 'Safe-Lock' Wire Rope Assemblies*. Ask for Catalog 5601.

Where to get: Macwhyte Co., Public Relations Dept., Kenosha, Wis.

Subject: **Euclid Scraper**

Content: Euclid's Model TS-18 Twin-Power scraper is described in a new catalog, which contains condensed specifications and a performance graph to provide data on engines, transmissions, tires, scraper controls, weights and dimensions, speeds and grade ability. The TS-18 contains two 218-hp engines, one in the tractor and the other in the scraper bowl, each driving an axle through a separate Torqmatic Drive. If more horsepower is desired, a 300-hp engine is available in the tractor. Action views show how hydraulic lever action of apron, bowl and ejector provides fast, independent control of all scraper operations. Ask for Form 552.

Where to get: Euclid Div., General Motors Corp., Cleveland 17, Ohio, or from Euclid dealers.

GET 59% MORE LIGHT OUTPUT...
From Model 120 500 Watt
STURDILITE
FLOOD LAMP
• Steps up night-time production —
• Adds to SAFETY! . . .
• Especially Adapted for Operations Such as Open Pit Mining, Stripping, Dredging, Excavating, Crushing and Mix Plants, Logging, Road Building, Drilling, Quarrying, Etc.
WRITE For Illustrated Folder
Metal Spinning Division
PHOENIX PRODUCTS CO.
4723 N. 27th St. • Milwaukee 9, Wis
Model 120-500 (500 Watt)
Model 120 (300 Watt)
EXCLUSIVE! Ventilated Housing Assures Longer Lamp Life

IN LARGE COPPER PITS . . . AND THE WORLD OVER

King-Size Excavating Jobs Profit From Bucyrus-Erie Electric Shovels

From a famous open-pit copper mine in western U.S., about 240,000 tons of ore and overburden are removed each day. Since operations began in 1904, an estimated 1½ *billion* tons have been excavated.

King-size jobs like this call for the big-output ability of Bucyrus-Erie Ward Leonard electric shovels. A new 4½-cu. yd. 110-B and a 6-cu. yd. 150-B are now at work there for the Isbell Construction Company of Reno, Nevada. In addition, the company employs a new Bucyrus-Erie 40-R rotary blast hole drill on this job.

The modern front-end design and heavy-duty construction of these shovels provide great strength while eliminating power-wasting deadweight. Ward Leonard electric control permits rapid acceleration and deceleration for high-speed work cycles.

There are many other advantages of these machines you should know about if you are faced with big-yardage excavating. Why not write for the complete story!

B1L56C

GLOBAL APPROVAL
MOROCCO · PHILIPPINES · RHODESIA · UNITED STATES · VENEZUELA · ALGERIA · CANADA · CONGO
110-B 4½-cu. yd.
150-B . . 6-cu. yd.
190-B . . 8-cu. yd.
BUCYRUS ERIE
INDO-CHINA · FRANCE · FINLAND · ENGLAND

BUCYRUS-ERIE COMPANY South Milwaukee, Wisconsin

Notes from the Manufacturers

Allis-Chalmers Mfg. Co., Tractor Group, Milwaukee, Wis., has appointed W. J. Klein as vice president and director of sales. W. L. Voegeli has been named general sales manager. Klein had been vice president and general sales manager, Tractor Group. Voegeli had been assistant director of engineering.

American Hoist and Derrick Co., St. Paul, Minn., has expanded its manufacturing operations to the West Coast. A new corporation, American Hoist Pacific Co., has been formed with headquarters in Seattle, Wash. The new firm will primarily produce special custom-engineered heavy materials handling equipment that is not normally offered by American Hoist. Major markets to be served on an international basis will be power plants, offshore drilling, specialized construction, and transportation. Special emphasis will be placed on certain types of unusually high capacity lifting devices employed in the testing of nuclear weapons.

Aveling-Barford, Ltd., Grantham, England, has appointed G. M. Warren as local director and member of the board of management. He has been with the company since 1946. He will continue as export sales manager.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Giles & Ransome, Inc., Philadelphia, Pa., as a new distributor offering sales and parts service on Bucyrus-Erie excavators and cranes in eastern Pennsylvania, southern New Jersey and the entire state of Delaware. Giles & Ransome will handle the full line of ⅜ to 4-cu. yd. excavators and cranes; 15-ton to 25-ton capacity Transit Cranes; 5-ton and 10-ton truck-mounted, all-hydraulic Hydrocranes; and dragline buckets. The territory includes the entire state of Delaware, the New Jersey counties of Ocean, Burlington, Atlantic, Cape May, Cumberland, Salem, Gloucester and Camden, and the Pennsylvania counties of Northampton, LeHigh, Berks, Chester, Montgomery, Bucks, Delaware and Philadelphia. Complete equipment servicing facilities and parts stock will be maintained at the new distributor's plant at 2729 Hunting Park Ave., Philadelphia, Pa. A branch office is located at Route 40, Bear, Del.

Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich., has appointed King-McIver, Inc., Greensboro, N. C., as distributor in North Carolina for the division's line of two-cycle diesels. King-McIver has acquired the diesel sales and service operation of the E. F. Craven Co., Greensboro.

General Electric Co., Metallurgical Products Dept., Detroit 32, Mich., has announced the appointment of

Continued on page 72

BUCKET FULL OF PROFIT!
Omaha Dragline Buckets eliminate unnecessary weight which makes room for a bigger payload. A high arch gives more clearance for digging and dumping. Nearly 50 years of "know-how" enables Omaha Dragline Buckets to pass all actual field tests. You can't buy a better bucket!
Write today for catalog giving specifications for four types available.
OMAHA
DRAGLINE BUCKET
DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

Coming SOON

A NEW Profit-Maker FROM

BUCYRUS ERIE

196E56-a

Watch for it!

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

EXCEPTIONAL VALUES IN USED CONSTRUCTION EQUIPMENT

955 P&H Dragline, 90', 2½ yd.
1201 Lima Dragline, 85', 3 yd.
903 Osgood Dragline, 70', 2 yd.
800 Osgood Dragline, 70'
802 Lima Cranes
604 Lima Comb. Shovel & Crane
54-B Bucyrus-Erie Comb. Drag & Crane
38-B Bucyrus-Erie 1½ yd. Crane
80-D Northwest Comb. Shovel & Dragline
655 P&H Dragline, 45' boom
1201 Lima High Lift Shovel, 42', 2½ yd.
54-B Bucyrus-Erie 2½ yd. Shovel
3000-B Manitowoc 2 yd. Shovel
2000-B Manitowoc 1½ yd. Shovel
38-B Bucyrus-Erie 1½ yd. Shovel
77 Lorain 1½ yd. Shovel
820 Osgood 1½ yd. Shovel
44 Lima 1 yd. Shovel
43 Marion 1 yd. Backhoe
Unit 1020 ¾ yd. Shovel—1 Yr. Old
22-B Bucyrus-Erie ¾ yd. Shovel
Bay City ½ yd. Backhoe
Bay City, Lorain, P&H & Osgood Truck Cranes
Shovel, Drag, Crane & Backhoe Attach. —Drag & Dipper Buckets for most makes and Models
Euclid Trucks—7FD, 18FD, 8TD, 36FD, 82FD, 13TD, 14TD, 63TD—Bottom & Rear Dumps
Garwood, LeTourneau, Caterpillar, Euclid & Bucyrus-Erie Scrapers
Huber 3-5 ton Tandem Roller
Buffalo-Springfield 10 ton Roller
International Bulldozers
Allis-Chalmers & Caterpillar Dozers, Front End Loaders, Graders, Carryalls
600 Reich Heavy Truck Mounted Rotary Air Drills (Both Lever Arm & High Mast)
58-BH Joy Champion Rotary Air Drills
42-T, 29-T & 27-T Well Drills
Davey Rotary Truck Mounted Air Drills
Mayhew Rotary Truck Mounted Air Drills
Portadrill Truck Mounted Air Drill

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Page 625 diesel dragline, S/N 242, new in 1951, has 150' boom and 9 yd. Page bucket; machine in A-1 condition; available now; located near Pittsburgh, Pa. Price $225,000. Box 3697

Model 175 Bucyrus-Erie electric dragline, rail mounted, 125' boom, 5 yd. bucket.
Model 360 Marion electric dragline, rail mounted, 156' boom, 8½ yd. bucket.
Central Florida location—priced as is or loaded for rail shipment.
R. H. CLARK EQUIPMENT CO.
P. O. Box 2566 Mulberry, Florida
Phone 2541 or 2881

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

Page 620 dragline, S/N 165, new in 1943; has 120' boom and 5 yd. bucket; machine in good working condition, but idle since November 1955; located near Pittsburgh, Pa. Price $50,000. Box 3698

Lima 2400 dragline equipped with 110' boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine; 63" wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

Bucyrus-Monighan Model 6160 Diesel Dragline 160' boom, several buckets 8 to 10 cubic yd. sizes. Base 36' diameter, engine Fairbanks-Morse diesel, separate Caterpillar engine for swing generator, approximately $50,000 worth of new and used parts.

One all-steel bulkheaded spud barge, 175' x 49', 6" x 11' deep, 3 drum hoist, ample fuel and water storage capacity, will clear all Mississippi River locks and meets U. S. Coast Guard requirements.

Will sell dragline alone or in combination with barge. Will not sell barge alone unless dragline has been sold.

For further details or inspection please reply to: Box 3704

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

MANITOWOC MODEL 3500 STRIPPING SHOVEL, S/N 3602; equipped with 45' boom, 34' sticks and 2 cubic yd. dipper; powered with Caterpillar D-17000 diesel engine new in 1951; machine is in good operating condition. Price $35,000 as is, where is, and can be inspected at Sunnyhill Coal mine near New Lexington, Ohio. Box 3692

Bucyrus-Erie 22-B, Caterpillar D318 engine; machine used only part time; absolutely perfect throughout; must see to appreciate; ¾ yd. rock bucket; excellent undercarriage; financing available. Call or write Midland Machinery Co., Chillicothe, Mo. Phone 280.

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

Northwest model 6 shovel, serial no. 14415; powered by super charged Murphy model 20 diesel engine, serial no. 15754. Condition: very good.
Price f.o.b. Denver (loaded) $27,500

One Lorain L-80J shovel attachment from machine serial no. 21294. Condition: very good.

One Bucyrus-Erie 20-B shovel attachment. Condition: fair.

One Bucyrus-Erie 10-B shovel attachment from machine serial no. 11772. Condition: fair to good.

One Bucyrus-Erie 10-B dragshovel attachment from machine serial no. 15277. Condition: fair to good.

THE COLORADO BUILDERS' SUPPLY CO.
West Evans & South Mariposa Sts.
Denver, Colorado WE 5-3571

Northwest 25 ¾ yd. shovel with 24" treads and G.M. 3-71 diesel engine. New 1948.
Price f.o.b. Greensboro, N. C. $7,500
Bucyrus-Erie 10-B crane, gas engine, Serial #14448. As is.
Price f.o.b. Greensboro, N. C. $1,500
Allis-Chalmers TS-200 motor scraper with A-C diesel engine.
Price f.o.b. Greensboro, N. C. $17,500
Jaeger 600' compressor with Murphy diesel engine, on 4 pneumatic tires.
Price f.o.b. Greensboro, N. C. $5,500

E. F. CRAVEN COMPANY
Greensboro, N. C.

SHOVELS & CRANES

Quickway Model L, ½-yd. with 40' boom and shovel, gas engine mounted on White half-track; first class condition.
Price, f.o.b. Louisville, Ky. $7,500
Bucyrus-Erie Model 10-B, ⅜-yd. shovel on crawlers; good operating condition.
Price, f.o.b. Louisville, Ky. $3,750

ATTACHMENTS

Bucyrus-Erie 10-B ⅜-yd. shovel front..$ 850
Bucyrus-Erie 15-B ½-yd. shovel front.. 1,275
Bucyrus-Erie 22-B ¾-yd. shovel front.. 2,500

Write, wire or phone:
Jim Waddell

BRANDEIS MACHINERY & SUPPLY COMPANY
Brook & Warnock Sts., Phone MElrose 7-4741
Louisville, Kentucky

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

USED EQUIPMENT

2 YARD SHOVEL-CRANE DRAGLINE MODEL 820 LORAIN—Cat D13000, 70' boom, fairlead, maximum counterweight, extra parts and 2 yd. AMSCO Shovel Dipper. Lots of machinery at a price!

¾ YARD CRANE-CLAM COMBINATION MODEL 40 GENERAL—swamp cats—Buda gas power. Excellent condition!

1 YARD SHOVEL MODEL LS-90 LINK BELT in like-new condition, hoe or crane equipment available, as desired. Save $$$ on this rig!

¾ YARD CRANE-CLAM COMBINATION P&H MODEL 255 with grouser type crawlers. Workable at a give-away price. Just the rig for winter rebuilding!

½ YARD CRANE-CLAM COMBINATION UNIT MODEL 357—self-propelled, rubber tired wagon carrier—very good condition. Hoe boom available. A good buy!

½ YARD BACK HOE BUCYRUS-ERIE MODEL 10-B—very good condition. Priced to move!

¾ YARD MODEL J QUICKWAY HOE-SHOVEL COMBINATION, truck mounted in excellent condition. Make us an offer!

H-3 HYDROCRANE on L-170 I.H.C. truck, equipped with tagline reel and clamshell bucket. Repainted and ready to work.

H-2 HYDROCRANE (2 ton)—2 available in working condition. Call or wire for location to inspect.

MISC. FRONT END LOADERS, CEMENT MIXER UNITS & VARIOUS PIECES OF CONSTRUCTION EQUIPMENT AVAILABLE.

OFFERED SUBJECT TO PRIOR SALE

J. P. WAITE CONSTRUCTION CO.

3308 W. Pierce St. Milwaukee

Phone: EVergreen 4-1900

ZIEGLER FALL SPECIAL

EXCAVATORS

NEW **USED**

DEMONSTRATOR

Bucyrus-Erie H-3 Hydrohoe-Hydrocrane Combination Unit mounted on Ford F 600 truck. Hydrocrane boom extends from 18 to 26 feet. Clamshell bucket, steel cab, tagline and sprag included. Truck is equipped with 2 speed rear axle and turn signal lights.

USED

H-3 Hydrocrane-Hydrohoe Combination Unit mounted on GMC 6 x 6 truck. Hydrocrane boom extends up to 38 feet. Includes ⅜-yd. clamshell bucket, cab and Hydrohoe attachment. Unit is driven by power take-off from truck engine. Hydrocrane purchased new in 1952. Truck is war surplus but has had motor, transmission and rear drives completely rebuilt last year.

Photographs sent on request

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Bucyrus-Erie 10-B ½ yd. shovel attachment, front end only, like new condition. Price: $300; counter weight 2000 lb. Price: $125. Spare parts cheap. McCandless Cons. Co., 1625 E. Kearney, Springfield, Mo.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners. Box 3696

FOR SALE

1020 UNIT ¾ YARD SHOVEL

4 Cyl. GMC Diesel

1 Year Old

Excellent Condition

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Need all sizes—rear dump trucks

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We pay cash for your equipment

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Notes . . .

Continued from page 70

George M. Hartley as manager of marketing. He formerly was sales manager of General Electric's Chemical Materials Dept.

H. K. Porter Co., Inc., New York 22, N. Y., has acquired the business of West Virginia Steel & Mfg. Co., Huntington, W. Va. The operations of the new plant will be combined with Porter's Connors Steel Div., Birmingham, Ala. West Virginia Steel melts and rolls electric furnace steel and rails. Allen M. Harrelson has been named Porter's vice president and treasurer.

Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., has appointed the Hatten Machinery Co., 3433 Fourth Ave. S., Seattle, Wash., as a distributor for its scraper line in western Washington. Wooldridge has opened a complete parts warehouse at Melrose Park, Ill.

WATCH

For Announcement of

196E56-d

NEXT MONTH

BUCYRUS ERIE

There's a difference in parts quality. And there's a whale of a difference in parts *service*, too.

At your Caterpillar Dealer your order is checked against up-to-the-minute parts catalogs and other *strictly current* references. You're always sure the parts delivered are the *right* parts—they fit and function properly. But while your Caterpillar Dealer naturally excels in emergency service, your needs are mostly routine; and his routine service is quick, accurate and complete, too.

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EIMCO 105 – A LOADING CYCLE TIME SAVER

Working for a major railway firm in track maintenance operations, an Eimco 105 Tractor-Excavator provides extra-production capacity in loading out a 50-cubic-yard car every eight minutes. The Eimco loads 125 cubic yards more every hour than the machine it replaced.

For this steady job, the 105 is equipped with the high discharge rocker arms and bucket.

The Eimco replaced a 1½ yard shovel that was loading five cars an hour. Before the operator mastered extra-production features of the 105, it was loading six cars an hour. With an experienced operator, it now averages 7½ cars an hour.

Previously, one of two dozers pushing gravel toward the loading edge, came off the 50-foot-high pile to push loaded cars to the switch. The 105 now accomplishes this task and the shovel and one dozer have been released to work elsewhere.

How does the 1½ yard Eimco, with an initial investment that is nearly one-third less, take on extra duty and still increase production?

The answer is in the 105's ability to save time during every loading cycle. With one hand, the operator pushes two, easy-to-reach levers and the Eimco moves in for a load. Powerful crowding actions fills the bucket quickly. He pulls the levers and the 105 reverses to the haulage car while the loaded bucket is elevating in an arc.

When the Eimco is in dumping position, the bucket is in discharge position. There's no lost motion between loading and discharge.

Independent track control permits the 105 to maneuver fast and sharp—another time saver.

And shifting between high and low speeds—forward and reverse—is done under maximum loads at anytime without injury to the transmission. You don't have to stop to shift—or hesitate until the tachometer needle falls below the recommended RPM reading.

The best way to get an idea how the Eimco 105 will increase your production is to watch it perform. You can arrange this today by writing Eimco.

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